



UTAH MUSEUM OF NATURAL HISTORY

University of Utah



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PROJECT DESCRIPTION
DFCM Job # 2243750
University of Utah Project # 0872-9630

October 21, 2004

HANBURY EVANS WRIGHT VLATTAS + COMPANY
E. VERNER JOHNSON & ASSOCIATES, INC.
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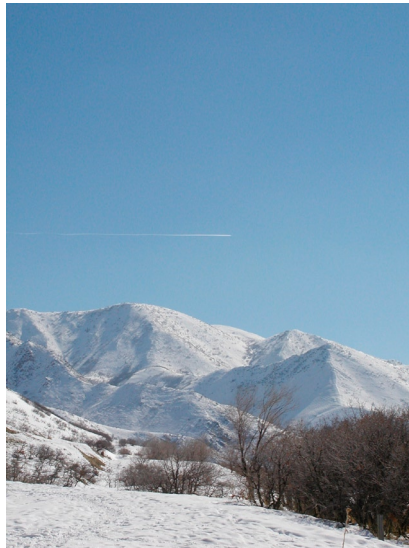
1.0 EXECUTIVE SUMMARY

1.1 Utah Museum of Natural History Mission Statement

The Utah Museum of Natural History illuminates the natural world and the place of humans within it.

As Utah's state museum of natural history at the University of Utah, we:

- Foster an understanding of science as a journey of discovery and wonder.
- Promote the preservation of biological and cultural diversity.
- Preserve collections in trust for the future generations.
- Encourage new perspectives on and inspire passion for the natural world.
- Celebrate Utah's native peoples and cultures.
- Showcase Utah's unique and extraordinary environments.
- Create knowledge through innovative research.
- Demonstrate the myriad links connecting the past, present and future.
- Transcend scientific disciplines to reveal the networks inherent in nature.
- Serve as a center for science literacy, acting as a bridge between the scientific community and the public.
- Empower people to make thoughtful decisions about the future.



1.2 Project Goals

Based on our conversations with the Museum staff, the advisory board, University of Utah staff, and community constituents, a set of ambitious goals for the new Museum project have been established:

- Forge a new identity for the Museum by building on its existing reputation and resources, and leveraging those assets through new and innovative partnerships -- not just on-campus, but throughout the city and region.
- Take on a regional identity, and become an economic and cultural asset for Salt Lake City, the state of Utah, and the Intermountain West.
- Provide first-rate research facilities for Museum scientists and a venue for undergraduate and graduate training at the University of Utah.
- Expand the existing visitor base to include adults and young adults.
- Incorporate student facilities and programs to retain a vital connection to the campus community.
- To attract tourists, become a meta-visitor center for the state and the region -- the place to start and end your Utah visit, providing both a regional visitor center and in-depth information about the state's past, present, and future.
- Build a beautiful, sustainable facility with minimal impact to the site.
- Become a new model for natural history museums through integrated use of collections and resources, organized in a multidisciplinary thematic structure.

1.3 Summary of Existing Facilities and Program

The Utah Museum of Natural History occupies three buildings: The George Thomas Building, portions of the Stewart Building, and part of a climate-controlled warehouse southwest of downtown Salt Lake City. The George Thomas building was constructed as the University of Utah's library in 1934; it began housing the Museum in 1969. The Thomas building houses the exhibits, administrative offices, education department, exhibit workshops, and portions of the collections and research laboratories.

The Stewart building, constructed earlier in the 20th century, houses the archaeology research laboratories and offices, portions of the anthropology collections, and the Museum field equipment. The warehouse houses supplies, equipment, and furnishings, plus large fossils in plaster jackets.

Challenges with the current facility include limited parking (12 stalls), a changing gallery too small to accommodate most national traveling exhibits, lack of a loading dock, inadequate climate control throughout, insufficient classrooms to accommodate current demand, insufficient office space to house current staff.

Phase I of a Master Plan, which considered Museum programs, the local market, the research collections, and existing facilities, was completed in 1994. A number of alternatives to addressing facility shortcomings were considered (these included renovation, adding to the current facility), and the final recommendation was to develop a new facility.

(Refer to Appendix for Summary of Existing Facilities Area and Plans.)



1.4 Project Description

1.4.1 Total Facility Summary

The Utah Museum of Natural History (UMNH) will be a new facility consisting of 169,000 gross square feet (GSF) of space. The UMNH will provide space for public awareness, education, and entertainment as well as space for collections, research and general work areas. This museum program satisfies the long-term needs of the Museum and its programs, in addition, the site is adequate to allow for future expansion. The Museum expects future expansion will be needed for collections and exhibition. The site and building planning will take expansion opportunities into consideration.

The Museum program is approximately 130,000 net square feet (NSF), and 169,000 (GSF) with a 1.30 multiplier for the efficiency ratio. Through discussion and workshops with the Utah Museum of Natural History, the University of Utah Facilities Management, and the Utah Division of Facilities Construction and Management, the anticipated building height will be three stories tall, partially below grade on the upper slope of the site.

The new Museum space program includes the following areas:

Summary of New Museum Areas	Net Area
Visitor Services Facilities	14,240
Public Programs	52,800
Research and Collections	31,560
Staff Work Areas	17,420
Building Services	<u>13,980</u>
Total Net Area	130,000
Net to Gross Factor	<u>+/- 1.3</u>
Gross Area	169,000

The site development program also includes a 200-car parking structure adjacent or attached to the Museum.

1.4.2 Project Budget

To be provided by UMNH

1.4.3 Project Schedule

The overall Project Schedule is as follows:

Design Phase:

Selection of Design Architect / Architect of RecordNovember 2004
Selection of Exhibit Designer January 2005
Select Exhibit Fabricator June 2005

Bidding and Construction Phase:

Start Bidding Process for Building March - May 2006
Start Construction Process for Building..... June 2006
Start Fabrication of ExhibitsDecember 2006
Building Construction Substantial Completion April 2008
Exhibit Fabrication / Installation Substantial Completion..December 2008
Collections Relocation by Owner CompletionJune - December 2008
Occupancy October 2008

1.4.4 Project Procurement

The above schedule anticipates this project will be competitively bid for both the Building and the Exhibits.

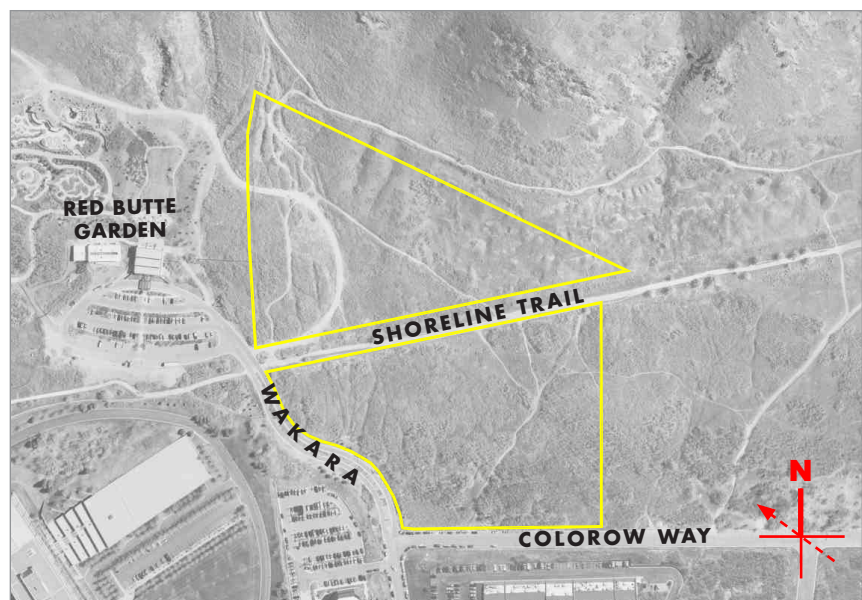
2.0 SITE ANALYSIS

2.1 Site Location

The proposed museum site is located in the southeastern quadrant of the University of Utah campus. It is adjacent and South-and-East of the Red Butte Garden, adjacent to the western foothill slope of the Wasatch Mountain range, and on the western margin of the Middle Rocky Mountain physiographic province. The site is an undeveloped parcel of land, approximately 14 acres, provided by the University of Utah for the development of the new Utah Museum of Natural History. There is currently a utility easement that bisects the site along the Northwest / Southeast axis and is used as a hiking/biking trail, known as the Bonneville Shoreline Trail. The adjacent parcel of land to the south, owned by the University of Utah, is currently under development by NPS Pharmaceuticals to construct a new three-story laboratory building.



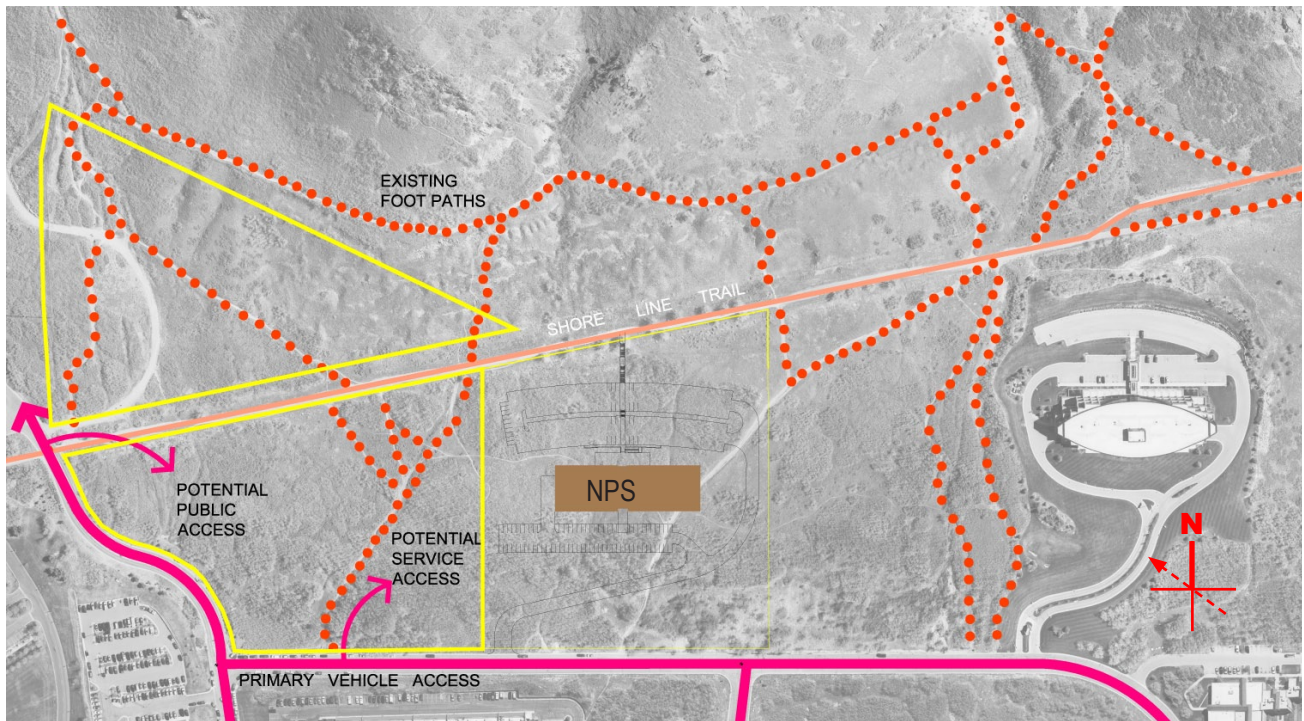
Site Location



Property Limits

2.2 Existing Site Circulation

The site is presently undeveloped. There are two existing curb cuts along the south edge of the Red Butte Garden entry drive at and above the point of intersection with the Shoreline Trail that provide access to the utility easement and a temporary service road to the southeastern portion of the Red Butte Garden property. All other access is by pedestrian / bicycle paths that traverse the site entering from various locations along Colorow Way and the Red Butte Garden entry drive. Pedestrian / bicycle access also exists on the southern end of the site via the Shoreline Trail. The Shoreline Trail is a utility easement that is used by pedestrians and service vehicles.



Circulation

2.3 Existing Site Conditions

2.3.1 Climates, Views, and Key Open Spaces

2.3.1.1 Climate

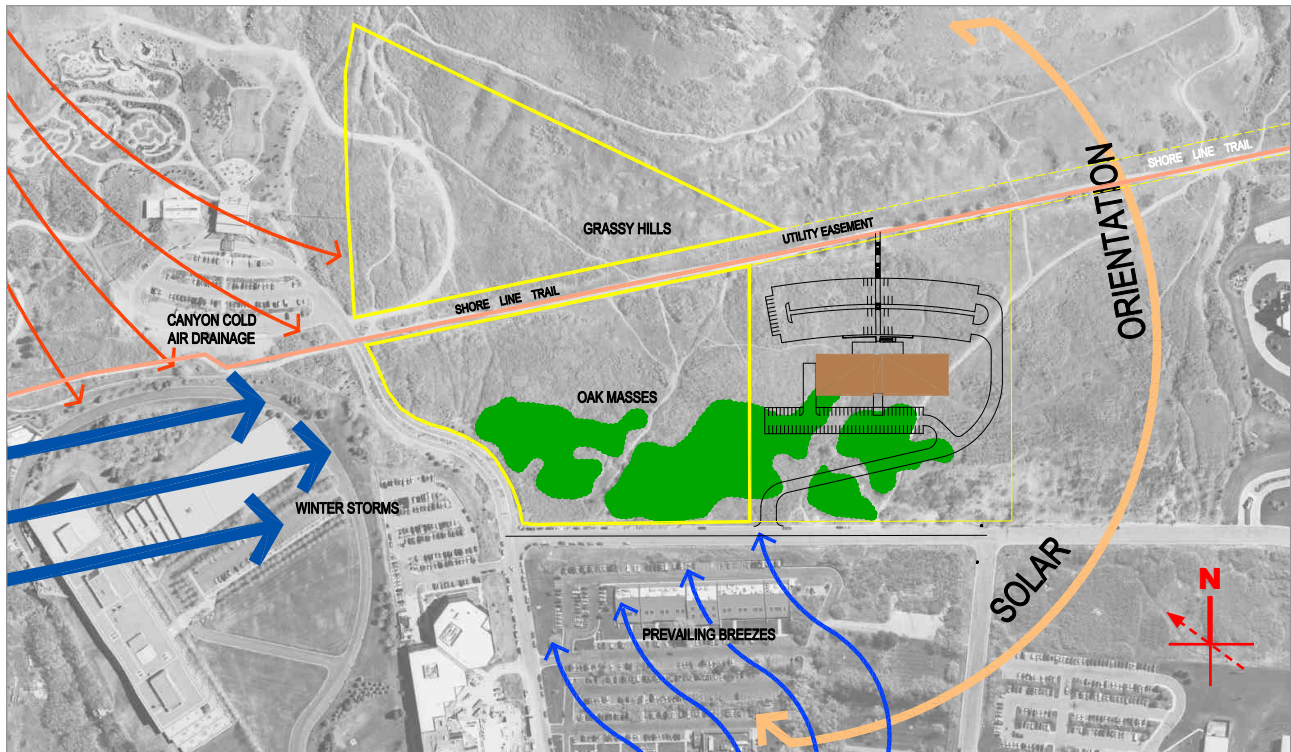
The site is located within the city limits of Salt Lake City at the foothills of the Wasatch-Cache National Forest. The temperatures in this region range from winter low temperatures of 5 - 25 degrees F to summer highs of 100 degrees F. The average annual rainfall is thirteen inches (13") with a relative humidity ranging from 15 - 30%. In general, the prevailing winds are from the northwest, which is also the direction for winter storms. Located on the east bench of the Salt Lake Valley, the site will typically see substantially more snow than the downtown area. According to the National Weather Service Forecast Office records, the average winter snowfall is approximately 53", therefore, in the months of December through March the site will require frequent snow removal. The Museum can expect greater snow amounts on this site than they currently experience at the present location due to a higher elevation. Strong canyon winds approach the site from the north/northeast that create very cold conditions during the winter.

2.3.1.2 Views

The proposed museum site offers spectacular views, internal and external, from almost every vantage point on the site. The views on approach to the site are significant and offer the opportunity to develop an iconic feature on the site. The view corridors from the site are unique and exciting. Each view provides a visual and educational experience. The view to the North is Red Butte Garden and the mountain ridges; to the East, grasses, low growing oak woodland, and rocky ridges dominate the view corridor; to the South, views of the Salt Lake Valley and Wasatch Front in the distance with a foreground of grasses and low-growing oak woodlands on the lower portion of the site, and a partial view of a roof-top to the Huntsman building and the NPS building currently under construction; to the West, an extraordinary view of downtown Salt Lake City, the Great Salt Lake, and Great Basin mountain ranges in the distance with a foreground of grasses and low-growing oak woodlands.

Within the non-urban context of the site, view corridors provide a varied visual experience as one traverses the natural setting of the site.

The building massing and the site design should respect the landscape and the visual corridors to enhance the site and the museum. The site and the museum should be designed to incorporate the site into the interpretive plan of the museum experience.



Site Analysis

2.3.1.3 Key Open Spaces

The site is completely open with low growing woodlands and meadow grasses. The section of the site, west of the Shoreline Trail, has a clear area surrounded by the low oaks which block the views of the roof-tops immediately adjacent to the west of the site. The upper portion of the site provides grand open spaces with a rapidly increasing grade to the east. Anywhere along the Shoreline Trail offers open space and spectacular views of the surrounding landscape.



2.3.2 Soils Report

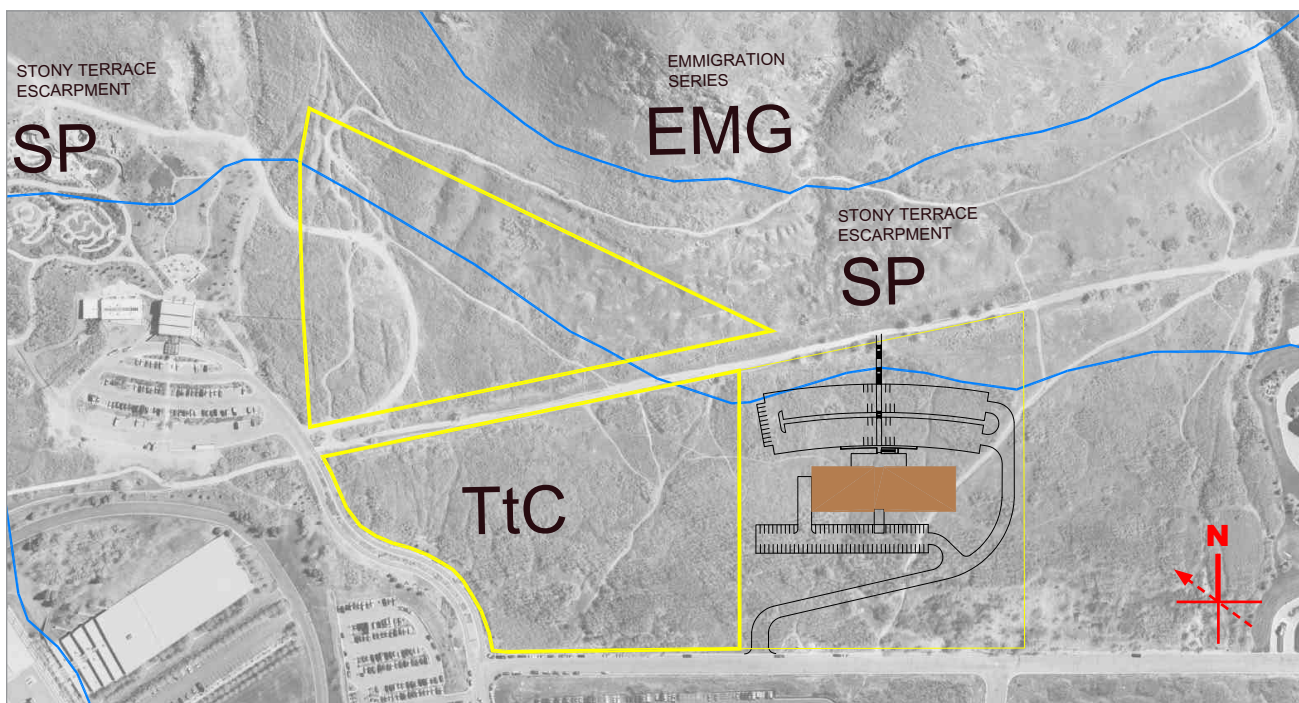
A formal geotechnical analysis / survey has not been performed on the property at the time of this report. However, the University of Utah and the Utah Department of Facilities and Construction Management provided the Planning Team with geotechnical reports for properties surrounding the museum property including the following: the Boyer Property (Huntsman Corporate Headquarters), dated December 1993; the proposed Red Butte Garden Visitors Center dated April 16, 1992; the proposed South Construction Access for Red Butte Garden dated November 1997; two reports for the proposed Children's Garden at Red Butte Garden dated December 12, 1996 and February 19, 1998. The Planning Team was also provided a copy of the "Engineering Geology for Land-Use Planning for Research Park, University of Utah, Salt Lake

City, Utah” that provided geological and mineralogical information in the general area of the proposed museum site and surrounding area.

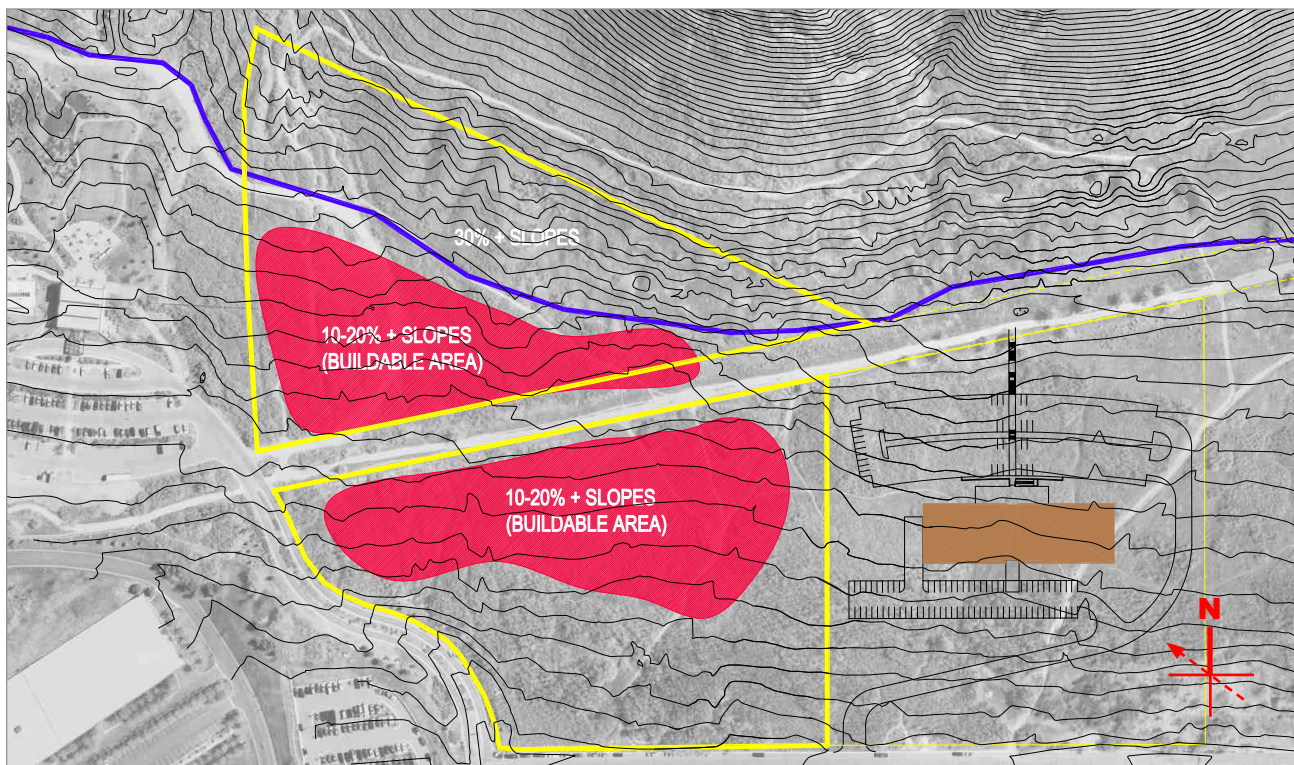
The University has performed a preliminary geophysical survey and site reconnaissance for the purpose of obtaining general surface and subsurface information including bedrock depths to be used in selecting a preferred building location. The survey was completed using non-intrusive geophysical methods. (Reference the survey report by Terracon, dated November 21, 2003.) The report identifies bedrock strata across the site at a depth of approximately twenty (20) feet. Excavation of this bedrock may require specialized excavation equipment and possibly blasting. Additional subsurface exploration is recommended to verify bedrock depths encountered.

Also noted in the Terracon report; the site consists of adverse foundation conditions including: expansive soils; collapsible soils; shallow ground water; excavation difficulty; and disturbed soils. Large boulders are anticipated in the northern portions of the site and near the apexes of the alluvial fans.

The adjacent property to the South is currently being developed for the NPS facility. Based on conversations with the architect of record, FFKR Architects, for the NPS project, the soils information generated for their project indicated similar conditions noted above for the museum property, along with some collapsible soils. According to FFKR, during the construction phase of the work minimal rock was encountered and no collapsible soils were encountered to the foundation bearing depth of approximately eighteen (18) feet below existing grade.



Soils



Topographic Survey

2.3.3 Topographic Survey

The University of Utah and the State of Utah Division of Facilities Construction and Management (DFCM) provided the Planning Team with a preliminary topographic survey of the proposed site and the surrounding land area. A complete and thorough survey will be accomplished by the DFCM during the design phase of the project.

2.3.4 Vegetation Survey

The University of Utah provided the Planning Team with a Vegetation Survey for the parcel of University land that includes the proposed Museum site and the adjacent site to the South, prepared by Bruce Glisson, Ph.D., dated November 5, 2003. The report indicates the varied vegetation types on the site and the adjacent properties which includes: Gambel Oaks (low and tall); Remnant sagebrush-bitterbrush-or native forb or grass; seeded grasslands; Russian Olive; Smooth Sumac or Squawbush; and an area of *Penstemon platphyllus*, a "watch list" species for Utah Natural Heritage Program, on the NPS site.

The report indicates the major plant communities were mapped by visual observation for estimated coverage. Gambel oak dominates most of the site, interspersed with remnant native shrub and grassland areas. The site still supports a variety of native species, but introduced species are well represented and often dominate entire areas and extensive portions of the understory. Introduced species include: escaped ornamentals or cultivated varieties; intentionally seeded species such as cultivated rye



and alfalfa; widely scattered weedy species; State-listed noxious weeds such as Canada thistle, Scotch Thistle, whitetop, and bindweed.

2.3.5 Wildlife Survey

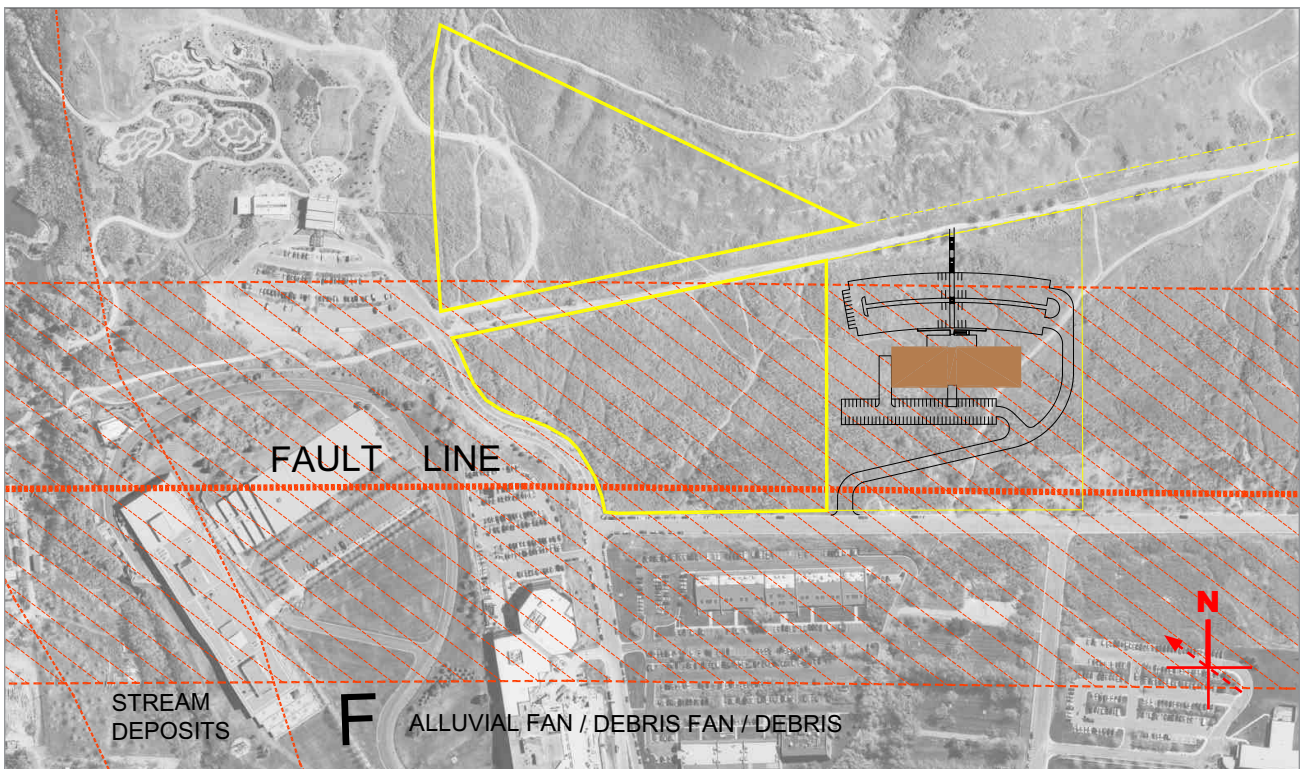
The Utah Museum of Natural History is responsible for procuring the survey, which at the time of this writing had not been commissioned.

2.3.6 Geologic Survey (fault line)

The Planning Team reviewed USGS mapping information on the internet, mapping information from the University of Utah, and information from the November 21, 2003 Geotechnical Report prepared by Terracon, to determine the approximate location of the fault line(s) in the Salt Lake City area and specifically near the proposed museum site. Further research is highly recommended prior to or early into the next phase of site analysis and/or design.

The site is located within the Wasatch Fault Zone where the potential for a large magnitude earthquake is high. The maximum potential earthquake magnitude along the Wasatch fault has been estimated to be on the order of 7.2 to 7.5.

Terracon performed a seismic refraction survey to determine approximate depths to bedrock at six seismic line locations. The report indicates the bedrock depths to be “inherently variable due to naturally occurring variances in soil and bedrock conditions along the seismic lines selected at the site”.



Fault Line

Two Quaternary faults have been identified: The East Bench Fault approximately one-half mile to the west of the site and an “interred” fault trace on the northwest portion of the western parcel. This fault is considered active and a potential seismic source for the site. Further investigation of the scarp is needed and perhaps at least one additional trench be excavated prior to planning for building locations on this parcel.

2.3.7 Environmental Impact Issues

The State of Utah/DFCM commissioned IHI Environmental to prepare a Phase One Environmental Site Assessment for the proposed Museum property. Although IHI was not able to visually inspect the entire property due to thick foliage, the report dated June 10, 2003, indicates the following:

- a) One ASTM “recognized environmental condition” identified during the investigation. This condition is described in the report. In summary, the property was the recipient of bullets from a shooting range on an adjoining property, formerly the Fort Douglas military base. The report indicates, “...all areas were visually inspected and have been reasonably cleared of all dangerous and/or explosive material reasonably possible to detect.” According to the report, no clean-up activities were conducted on the property prior to its transfer to the University of Utah in 1988. Although EPA recommended no further investigation and a visual inspection by the Department of the Army did not detect possible lead shot, IHI believes “the subject property may have been impacted by lead from the bullets fired from the former gun ranges.”
- b) No “other environmental considerations” were noted.
Based on the data in IHI’s report, HEWV suggests that the University commission an additional investigation(s) of the site to definitively conclude the existence or non-existence of any environmental conditions related to the shooting range.

2.3.8 Archeological Survey

The University of Utah Facilities Management and the Utah Museum of Natural History commissioned Mountain States Archeology to perform Class III cultural resources inventory of the approximately 14 acres of the proposed Museum property. The draft report dated August 18, 2003, as provided to HEWV, states: “Inventory found no new sites or isolated artifacts within the parcel itself.”

According to the report, much of the property provided poor ground visibility due to vegetative ground cover that some potential smaller finds may have been missed.

Based on the data in Mountain States Archeology’s report, HEWV recommends the University commission additional investigations to definitively conclude the existence or non-existence of any archeological conditions.



2.4.1 Existing Site Utilities

The site currently has a utility easement along the north and south axis of the site that contains two high-pressure petroleum lines, one natural gas line, and a domestic water line. The utility lines in the easement are not to be used for service connection for the new museum. Domestic water service and natural gas is available in Colorow Way. Electrical service is available and located underground in Colorow Way and other adjacent city-owned streets.

Northwest / Southeast Easement: Through conversations with the City of Salt Lake, Questar Gas, and Chevron Petroleum, the relocation of the easement and the associated utilities may be allowed at the expense of the University and/or the museum. This option must be explored further with the utility companies if the museum Design Team desires to locate the building(s) over the current easement location. The Design Team should also provide further evaluation of the cost to relocate the utilities based on any proposed relocation position.

2.4.2 Proposed Utility Connections / Relocations

All new utility work must comply with the University of Utah Design Standards. Also, all new proposed routing of new connections must be closely coordinated with the University of Utah Campus Design and Construction and Facilities Planning and Plant Operations.

Facility Service Connections: All utilities such as domestic water, fire water, irrigation water, sanitary sewer, storm sewer, telecommunications and electric will need to be extended from off-site locations to serve the new facility. All services can be connected to existing utilities in Colorow Way or Wakara Way.

2.4.2.1 Storm Drain

It is proposed the storm drain for the new museum building will connect into the existing 12-inch RCP storm drain piping system located at the corner of Colorow Way and Wakara Way. The new connection will tie into a new cleanout box. Prior to collecting storm water in the piping system, the water must be diverted to a storm retention system on-site, designed to retard flow rate. The storm water drainage system design shall be based upon a 100-year storm event with 24-hour retention.

According to the City of Salt Lake, the storm water design shall calculate the impact of mountain run-off. It is also likely on-site “Best Management Practices” (BMP’s) for water quality will be required. This property is in a primary recharge area for a drinking water aquifer. Appropriate care must be taken to protect the ground water.

2.4.2.2 Sanitary Sewer

It is proposed the sanitary sewer for the new museum building will connect to the existing 8-inch sewer main located under Colorow Way near the intersection with Wakara Way. According to the City of Salt Lake Department of Utilities, this line likely

has sufficient carrying capacity to support the additional load imposed by the proposed museum. The Design Team shall investigate and verify the existing lines adequacy.

2.4.2.3 Water Service

The existing 16-inch water line located in the North/South easement on the property cannot be tapped for domestic water for the museum, according to the City of Salt Lake. Therefore, the domestic water, irrigation water, and firewater service lines will connect to the 12-inch water line located in Colorow Way. There is also an existing 6-inch water line under the Red Butte Garden entry road. The existing line in Colorow was recently tested for a project in the Research Park and determined to be 132 psi. A pressure-reducing valve may be needed in the connection for the museum depending on the position and building height of the museum. The City recommends the culinary water connection be metered separately from irrigation and/or fire connections.

A maximum of three water meter taps is allowed by the city:

1. One for culinary
2. One for irrigation system. May be a separate connection to reduce the connection size down to below a 4-inch for culinary line.
3. One fire line that can service both on-site hydrants and the buildings fire sprinkler system.



Water / Storm Sewage

2.4.2.4 Chilled Water

Chilled water service from a campus wide distribution system is not available on or adjacent to the site.

2.4.2.5 High Temperature Hot Water / Steam

High temperature water and steam distribution systems are not available on or adjacent to the site.

The University of Utah and the Museum are interested in the possible use of a "geothermal system." The Design Team shall investigate this option and make a recommendation.

2.4.2.6 Natural Gas

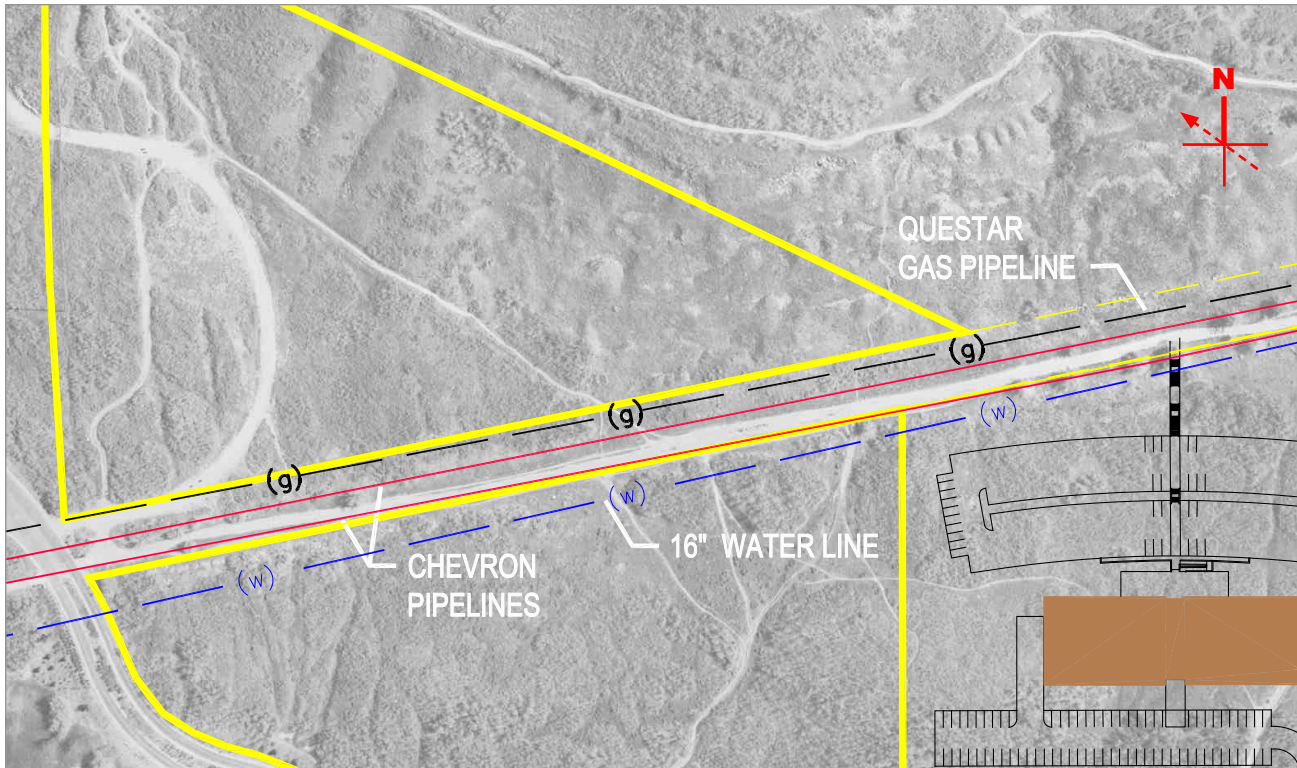
Natural gas will be used for heating and domestic hot water generation. It is proposed the gas will connect to the existing 4-inch natural gas line located on the western edge of Colorow Way. There is also an existing 6-inch line located in and/or on the northern portion of the Red Butte entry drive. Questar Gas Company believes there is adequate capacity in either line to serve the proposed museum development, however, they will need to confirm this based on the size of building and type of equipment in the facility that will use natural gas.

The Questar 20-inch high-pressure natural gas line in the North/South easement is not available for service connections.

Questar stated the 20-inch line in the North/South easement could be relocated if the museum desires and is willing to absorb the cost of the relocation. Other criteria established by Questar are:

- a) Building structures will not be allowed to be constructed over the easement except for surface construction such as plazas, sidewalks, and parking lots. However, these would need prior approval by Questar Gas Company.
- b) Elevated structure(s), such as a bridge type structure, over the North/South easement are discouraged by Questar Gas. Primary concern is the potential for trapping natural gas fumes under the structure in the event of a gas leak. If a bridge structure is proposed by the Design Team, the design shall be reviewed and approved by Questar during the early planning phase of design. Any elevated structures, if allowed by Questar, shall maintain a minimum clear space between grade and bottom of structure as defined by Questar.
- c) Requires a 36-inch minimum cover.
- d) Horizontal distance off the line: If the easement is a "described easement," building can occur up to the easement line. If not a "described easement," any building must be 15-feet minimum distance from either side of the line.

- e) If parking or other vehicular traffic, including construction vehicle traffic, uses the easement, temporary “bridging” may be required to protect the lines from the heavy loads.



Utilities - Gas and Oil

2.4.2.7 Site Electrical Power Distribution

There are two possible primary service connections to serve the museum:

- 1) Connect to the existing Utah Power and Light substation power grid adjacent to the Red Butte Garden. This option has a lower initial cost with a higher use and long-term cost.
- 2) Connect to the existing Utah Power and Light substation on the University of Utah side of the power grid. This option has a higher initial cost with a lower use and long-term cost.

Due to the discussions regarding available power sources for the Museum, the University of Utah prepared a “white paper” to evaluate the options identified above. The University determined that connection to the University’s electrical grid does “not make good economic sense”. A copy of this “white paper” is included in the Appendix for reference.

Service power is available in Colorow Way.

The University of Utah suggests that the potential use of a micro-turbine should be considered and investigated during the design process as a “green building” initiative. A micro-turbine can run off the accessible natural gas and museum could use the residual hot water produced by the turbine for other purposes.

The University of Utah suggested the use of Fuel Cells should be considered and investigated in the design of the museum.

Emergency generator(s) shall be incorporated into the design of the proposed museum. Generator(s) must be located adjacent to or near the building electrical transformer and set above grade to minimize impact from deep snowfall.

2.4.2.8 Site Lighting

Currently there is no lighting on the proposed museum site. Portions of the site are lighted by site pole lights on the adjacent Red Butte Garden site and by street lighting along Colorow Way and Wakara Way.

General and security site lighting shall be incorporated into the design of the site. The design shall adhere to the University of Utah campus lighting standards.

2.4.2.9 Site Telecommunications Distribution

It is proposed telecommunications and data services will connect to existing service lines/ductbank at the intersection of Colorow Way and Wakara Way. The museum should connect to the University of Utah NetCom fiber optic network system.

The cost of any new conduit runs to the building and all wiring, wire pull, plus installation and testing of IT / Phone systems outside and inside the building will be borne by the Museum and should be included in the Project Cost.

Telephone systems shall be connected to Quest.

2.5 Parking and Transportation

The Museum program has identified a need for approximately 200 on-site parking spaces to accommodate visitors and employees. Parking options have been identified as surface parking, a parking structure adjacent or separate from the Museum, or underground/aboveground parking under the Museum. Each option provides positive and negative impacts to the site planning and site use. Each option has particular budget ramifications.

The parking structure will require a fire protection system and possibly an air exhaust system due to the below grade construction.

The site design shall also incorporate a visitor “drop-off” area near the main entry to the Museum for the physically challenged individuals and for bus drop-off of group visitors. School buses and charter buses shall have access to the site and museum drop-off but on-site parking for the buses is not anticipated. Buses will be allowed to park along the curb of Colorow Way to await the groups departure.

2.5.1 Pedestrian and Bicycle Circulation (Refer to the Transportation Study)

2.5.2 Traffic and Parking Recommendations

Research Park roads, Chipeta Way, Colorow Way, Wakara, etc., are designed to accommodate 25,000 cars, so any additional traffic created from the development of the museum and expansion of RBG should not have a significant impact.

Shuttle service to connect Red Butte Garden and the UMNH with This-Is-The-Place through the street network of Research Park has been proposed as a future option by Research Park representatives. The likely connection would be at Colorow Way and the NW corner of This-Is-The-Place Heritage Park. The Transportation Study currently underway will address this issue. During the design phase of the museum development, the Design Team should confirm this option at the beginning of the planning and design phase.

2.6 Site Planning Principles

The planning and design guidelines set by the Research Park Planning District and the City of Salt Lake Zoning Department do NOT apply to the development of the Utah Natural History Museum on the University of Utah campus.

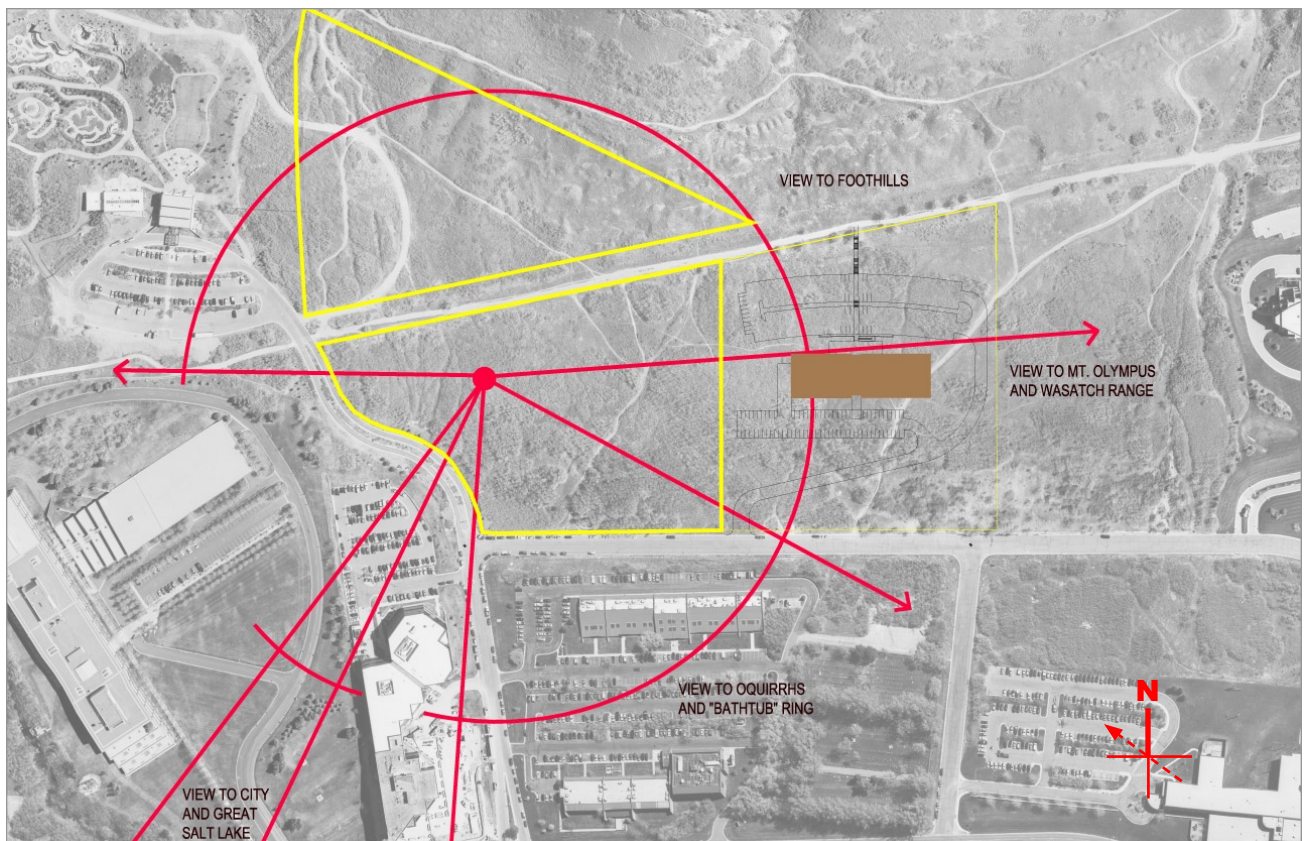
However, the museum property development shall adhere to the City of Salt Lake zoning as it pertains to curb cuts, new entries off City streets, etc.

2.6.1 Shade and Shadow

North facing public entries and delivery areas should be avoided due to wind-blown leaf collection problems and freezing precipitation in winter months. Entries should face west or south if possible. Minimize building shadowing of habitable outdoor spaces in winter, spring and fall; maximize shade in the summer. Utilize mature deciduous tree canopies as much as practicable to maximize shadowing in the summer months.

2.6.2 Views

The design should preserve/enhance existing view opportunities in all directions. The views shall be prioritized in accordance with the interpretive plan and the building architecture. Outdoor learning and activity spaces shall be incorporated into the site design that enhances the interpretive and learning opportunities provided by the site. Create design elements that enhance the views. Link the strategic views with the gallery focus allowing the views to become part of the internal/external interpretive experience.



Views

Landscape plantings and site structures may be used to frame specific views from the site and onto the site. Native vegetation should be reestablished on the site.

2.6.3 Shoreline Trail Over North/South Utility Easement

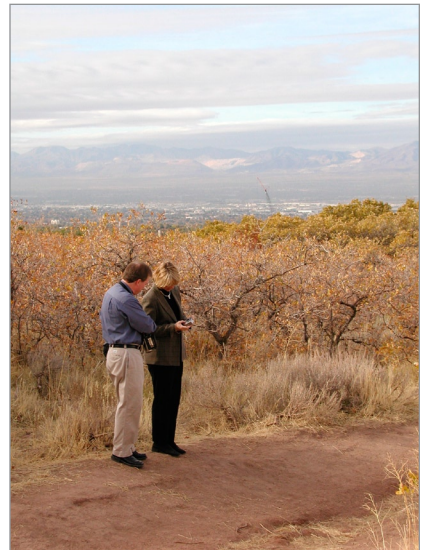
Hikers and bicyclers use the Shoreline Trail extensively. The location of the “Trail” may be adjusted to enhance the experience through the site, to enhance the view corridors, and to emphasize the connection with the physical museum structure. Careful attention should be given to the placement of the “trail” to encourage its continued use by hikers and bicyclers.



2.6.4 Outdoor Spaces

The Museum plan encourages the public’s use of the natural landscape and the incorporation of special outdoor spaces for social gatherings, interpretive/educational opportunities, and relaxation. It is the intention of the Museum to allow the public to access the site without property barriers restricting public access. This will require special evaluation during the early design phases of the project to develop an acceptable balance between the public’s access to the site and the security of the facility.

The exhibit plan encourages the use of strategic outdoor venues associated with particular galleries and themes that are accessed from the gallery space. Other outdoor spaces will be planned and strategically located around the site for the use as educational venues within the natural landscape. The Museum plans to incorporate the natural landscape and views as program space for educating the public. A small amphitheater and/or gazebo shall be considered for one or more of these outdoor venues.



Other outdoor spaces will be provided adjacent to the Museum to attract large gatherings, encourage public interaction, encourage small crowd and family picnic gathering, and space for large crowd queuing.

All outdoor spaces will be located on the site to capture the magnificent views of the landscape, both near and far, and/or positioned on the site to embrace particular flora/fauna on the site.



Pathways leading from the public drop-off areas and public parking facilities will be paved with a natural brick or stone paver that will support small truck traffic. Pathways throughout the natural areas of the site will utilize natural materials that are conducive to foot and bicycle traffic as well as to comply with accessibility requirements.

The development of the site shall embrace and enhance the natural landscape. Most areas of the site shall not be hardscaped.

2.6.5 Building Identity

Create a museum building that is a visual icon in Salt Lake City yet embraces the natural landscape. Create a building identity that states the purpose of the museum; to preserve, educate, and entertain the public.



2.6.6 Future Buildings

The museum does not anticipate adding any future buildings on the site. However, the museum should be designed and sited to allow for possible expansion of the collections storage areas.

2.6.7 Building Access

2.6.7.1 Snow Removal

The City of Salt Lake is responsible for snow removal on city-owned streets, including Research Park streets. The university will provide snow removal on drives and primary sidewalks on the Museum property. Snow removal on secondary sidewalks, secondary drive lanes, exposed loading docks, etc. will be provided by museum personnel.

2.6.7.2 Loading and Service

It is recommended that a service entry driveway be provided that is separate from the visitor entry driveway. Additionally, it is recommended there be two loading docks: one for exhibit and general wares delivery/service and one for food deliveries/service. Loading docks should be a part of the building with the ability to enclose the delivery vehicles into the loading bays, out of the weather. Service drives, turnarounds, and loading docks shall be designed to accommodate the tallest and longest tractor trailer rigs allowed on public roads.

The Design Team should also investigate the opportunities to share the entrance to the new NPS facility for use by Museum delivery and emergency vehicles. This opportunity must receive approval from the owner of the NPS property.

2.6.7.3 Parking

Museum attendance projections are being calculated by UMNH. Recent studies of other facilities indicate significant visitor increase resulted from an increase in net public space provided. UMNH does not want to overestimate the expected visitation number, which has an impact on programmed space and parking requirements.

Parking shall be provided for staff and visitors. It is anticipated that a structured parking for 200 cars will be required and should accommodate all visitor and staff parking. If underground structured parking is provided, the staff and visitor shall have direct and/or covered entry access to the main lobby of the museum. Surface parking to accommodate buses, vans, TV's, etc. may be desirable to the Museum, however, it is understood that tour and school bus staging between drop-off and pick-up will be allowed to occur along Colorow Way. This shall be confirmed at the early stage of the design phase by the Design Team.



2.6.7.4 Vehicular Drop-off

A significant number of tour buses, school buses, individual cars, shuttle buses, etc. is expected at the museum, therefore, a visitor drop-off area at the primary entrance to the Museum is important. The drop-off should be designed to accommodate several tour buses or school buses to load and unload simultaneously. On-site or remote parking shall be designed for or arranged for, for the staging/queuing of the buses. The number of buses to serve will be determined by the UMNH.

Due to the significant amount of annual snowfall, a covered drop-off and queue area should be considered in the design of the facility.

2.6.7.5 Emergency and Non-Routine Service Access

The City of Salt Lake provides emergency fire services to the University and therefore the City will need to review the proposed fire access plan for the site and facilities. Current information indicates the following:

- a) A maximum fire lane distance from any part of the building of 150-feet.
- b) A maximum hose distance from building of 250-feet.
- c) All emergency access roads around the building shall be paved and shall be approved by the City of Salt Lake and University of Utah fire officials prior to start of site design.

The site design shall consider the location of oaks and other vegetation in close proximity to the emergency fire lanes. Contact the Salt Lake City Fire Department regarding the scrub oaks adjacent to the fire access drives due to the potential for brush fires hindering fire vehicle access to the facility and site.

Pathways and walkways will be designed to accommodate emergency vehicles and occasional non-routine service access in accordance with the University of Utah Design Standards. Use differing paving materials/patterns and sign signage to designate emergency pathways. Use of fixed or removable bollards is discouraged.

Consider emergency access to the south end of the museum property through the adjacent development. Special arrangements would need to be negotiated with the owner of the property.

2.6.7.6 Security

City of Salt Lake and the University Police provide security patrols. Most patrols are by the University. The type, levels, items of security should be addressed. The University Police Department/Museum security has approximately 65 uniformed officers and approximately 30 police officers with guns. The University Police currently has police officers assigned to the

Museum. The University security has a mountain bike police division located in West Village.

The museum security design shall comply with University of Utah campus design standards and should be connected to the central campus security system. It is recommended that “blue light” tower(s) be provided in the parking lots and in any structured parking.

The University of Utah will provide police patrols, typical of other campus facilities. The site should be designed to minimize or eliminate the need for additional security personnel employed by UMNH.

The museum site will not be closed to pedestrian traffic during the non-open hours. Special attention to the site design and building design shall be provided to secure the site.

2.6.7.7 Site Lighting

Site lighting design will be critical to maintain safety and minimize site impact. The perimeter site lighting design shall conform to the City of Salt Lake guidelines. On-site pedestrian and general site lighting shall be in accordance with University of Utah lighting standards. The Design Team may propose alternative lighting styles, however, any recommendations that deviate from the guidelines and standards of the reviewing agencies shall have prior approval.

2.6.7.8 Accessibility

Wherever possible, all site paths shall meet ADA criteria for slope and landings. If this is unfeasible in a particular location, provide elevator access within the Museum that will allow wheelchair users to transition the non-compliant grade condition. All usable outdoor campus spaces shall be fully accessible.

2.6.7.9 Bicycle Access

The Museum and the University prefer to maintain bicycle access to the Shoreline Trail from Colorow Way and/or Red Butte Garden entrance drive. Provide for bicycle usage along the Shoreline Trail and bicycle storage adjacent to the museum entrance. Bicycle racks should be located near the public building entrances.

2.6.7.10 Pedestrian and Hiker Access

The Museum and the University prefer to maintain pedestrian access to the Shoreline Trail from Colorow Way and/or Red Butte Garden entrance drive. *Structures Over the Northwest / Southeast Easement Corridor*: The Design Team shall investigate the opportunities for site development/utilization by testing design options. Any option(s) that requires building(s) to

be constructed over the current North/South Easement, shall be presented to the three utility companies using the easement: Questar Gas, Chevron, and City of Salt Lake. Approval from all three companies must be provided before advancing with a design.

Questar has stated that they prefer no building structure on-grade or elevated over the easement. Chevron has stated they would consider the option of an elevated structure over the easement with the understanding the structure maintain sufficient clear height between grade and bottom of structure for construction vehicles. Chevron requires routine access along the easement any time of day for inspection purposes. The City of Salt Lake has stated they would consider an elevated structure over the easement as long as 24-hour access is provided along the line for maintenance, a minimum clear height of twenty-two (22) feet between finish grade and bottom of structure, and a minimum four-and-one-half (4-1/2) feet of soil covering the water line.

2.7 Proposed Site Considerations

2.7.1 University of Utah Long Range Development Plan Criteria

The Utah Museum of Natural History currently occupies a historic building on Presidents Circle, originally designed to house the University Library. The University of Utah Long Range Development Plan dated 1997 does not specifically address the replacement or relocation of the Utah Museum of Natural History. The Plan highlights the planning principles to be followed in the future development of the campus. The planning principles are comprehensive and functional assumptions of the overall Development Plan. The principles/criteria address both the natural and the built environment on the campus. Each criteria is established to strengthen the physical composition of the campus while accommodating future growth.

The University selected the UMNH proposed site prior to the beginning of this report's research and preparation. The site is located on the east bench of the Wasatch Mountains and is a relatively undisturbed natural setting that is very appropriate to the mission of the Museum. The site is on the periphery of Research Park and lies adjacent to the Red Butte Garden. The site provides the opportunity for the Museum to strengthen the natural resources corridor in that area of the campus.

The specific property for the Museum is not identified in the Long Range Development Plan but is currently owned by the University. The site provides the museum a unique opportunity to identify itself with a strong architectural image that also respects and becomes a vital part of the natural landscape.

Throughout the design phase of this Project, the University of Utah's Long Range Development Plan shall be reviewed to identify and promote the goals of the natural and built environment along the foothills of the east bench.

2.7.2 Land Use and Phasing of Construction

The Land Use Plan described within the University of Utah's Long Range Development Plan identifies the following general criteria:

- a. Academic buildings and student services buildings will be located in the core campus.
- b. Other support uses such as recreation, student health services and student housing will be located in peripheral areas.

The Long Range Development Plan is based upon several planning concepts that should be followed:

- a. Compact pedestrian-scale core
- b. Peripheral vehicular traffic/parking
- c. Preservation of historic qualities and features
- d. Student housing and recreational opportunities located adjacent to the academic core
- e. Expansion and decentralization of student programs, services and recreation to better accommodate user access and location of users

- f. A generous open-space network knitting the campus together
- g. Designation of campus reserve areas

2.7.3 Landscape Design Criteria/Interpretation Opportunities

The proposed site provides the Museum the opportunity to be a good steward of the natural environment by minimizing the impact to the site and by enhancing the opportunities for interpretation of the natural environment.

As proposed by the Long Range Development Plan, the Landscape and Open space component is comprised of four elements:

- a. The formal landscape of the central core and developed areas of campus
- b. The recreational landscape
- c. Campus edges and streetscapes
- d. The natural landscape associated with the hillsides and Red Butte Garden

For the purposes of the Museum development, the Campus edges and streetscapes and the Natural Landscape elements shall be understood to make the appropriate design decisions.

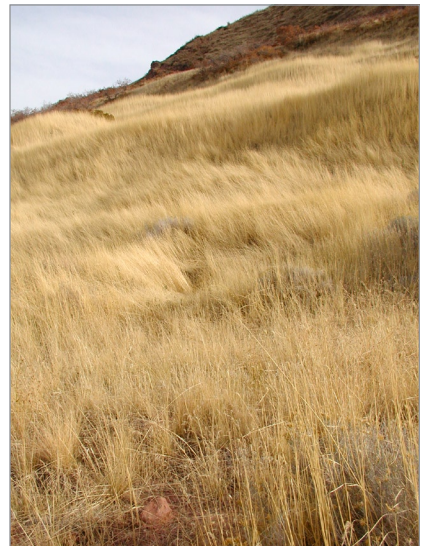
The Museum is proposing the incorporation of outdoor interpretive areas on the site to enhance the educational aspect of the natural landscape. The Museum also encourages the planning to incorporate the recreational access across the site for bikers and hikers to enhance the recreational and educational opportunities.

2.7.3.1 Outdoor Space Types and Features

The Design Team shall create an outdoor environment that allows the visitor to the Museum to experience the interrelationship of the natural environment with the built environment by creating venues of integration and interpretation. Create a formal entry condition to the Museum with the pedestrian drop-off. It is anticipated that the formal entry condition will have extensive hardscape area. The site also offers the opportunity to create outdoor interpretive venues in the natural landscape. Pathways to the Museum and all outdoor venues shall be accessible to the physically challenged as much as practicable and shall be in compliance with ADA criteria.

The site design shall also incorporate natural pathways for pedestrian access to the Shoreline Trail. This pathway shall be positioned on the site and designed to provide access by hikers, bikers, and walkers.

Informal natural areas shall be provided for informal interpretation of the landscape.



2.7.3.2 Site Accessibility

Paths to building entrances shall be designed in compliance with ADA design criteria for slope and landings. Wherever possible, all other site paths shall meet ADA criteria. All usable outdoor spaces shall be fully accessible.

2.7.3.3 Bicycles

It is anticipated that visitors and pedestrians will access the site and the Museum by bicycle on a regular basis and therefore provisions must be provided for site access and temporary bicycle storage. Bicycle racks shall be provided in lieu of bicycle lockers, primarily due to the short-term use expected. The racks shall be conveniently positioned on the site and near the building entrances.

2.7.3.4 Trash and Recycling Containers

Primary trash and recycling for building services shall be located at the loading dock area of the Museum. The Designer shall coordinate the number, sizes and details for trash and recycling containers with the Museum during the design phase of the project.

General use trash receptacles shall be provided around the site and near the building entrances where people enter the building and where visitors will congregate. Recycle bins should be provided adjacent to the trash receptacles to promote recycling. The Designer shall coordinate locations with the Museum during the design phase.

2.7.3.5 Plant Materials

Much of the plant material currently on the site is not native vegetation. It is the desire of the Museum to save and protect as much as practicable the oak trees on the site. New vegetation shall be indigenous plant material that can withstand drought conditions. Mass shrub plantings along pedestrian pathways should be avoided for security reasons.

2.7.3.6 Irrigation System

Irrigation should not be considered the primary source of plant vitality. Limited focal areas around the main Museum entrances may be irrigated. The landscape should consist mostly of natural vegetation and grasses that do not require irrigation. The design should also take advantage to any storm water management water features to enhance the natural environment and to minimize the need to irrigate. Xeriscape design concepts should be incorporated and coordinated with the University of Utah Grounds Department.

2.7.3.7 Site Lighting

Pedestrian pathway lighting shall be provided along the primary entrance walks and throughout the parking areas for security purposes. Strategic lighting opportunities should be explored to



minimize and avoid light pollution. The Museum desires to be a good steward to the environment and not impose high light levels around the site.

2.7.3.8 Paving Alternatives

The design should consider permeable paving materials in areas of low pedestrian traffic. Permeable pavements potentially reduce the amount of storm water run-off. Careful attention should be given to the pathway material in the natural areas to avoid material run-off and erosion.

2.8 Site Utilization

A variety of options for utilization of the site have been explored (see Appendix C). Before determining a preferred site for the building, conversations with Red Butte Garden must be pursued (see section 4.1.2.2) as must the opportunity to relocate the pipeline easements and Bonneville Shoreline Trail.

3.0 MUSEUM SPECIFIC BUILDING DESIGN

Uniqueness is a trait that characterizes museums both as a building type and as individual examples within the type. Since many museums are shaped around unique collections of objects and the museum's public programs and research activities are the outgrowth of those singular collections, it is not surprising that museum buildings present distinctive challenges and opportunities in their planning and design. The Utah Museum of Natural History is no exception.

UMNH has numerous characteristics as a museum that distinguish it from other building types, but it also has idiosyncratic aspects that make it unique among museums. The following pages of this section describe some of the general issues that make the design of museums unique, while the following section describes in more detail the singular attributes and requirements of UMNH.

3.1 Collection Care

Care of collections in a museum is one of the unique attributes that distinguish museums from other buildings and is a paramount issue in their design. For example, it is not unusual for the value of a museum's collections to be far above the value of the building that houses them; an inversion of the more typical scenario where the value of the building exceeds the value of its contents.

Also, since museums with collections operate as repositories of valued artifacts and ecofacts, their role as stewards of those collections requires a standard of care for their contents that is higher than most other types of buildings. Collection objects entrusted to a museum, whether part of the permanent collection or on loan from another institution or individual, must be protected from theft, damage, and deterioration while in the museum's care. In the case of permanent collections, this means protecting the objects forever.

If storing and protecting collections were a museum's only jobs, the task of designing them would be simpler by magnitudes. However, museums also research, exhibit, and interpret their collections for academic advancement and for the enjoyment and education of the public. These uses of collections set the collections into motion within the museum and create a series of objects/viewer interfaces that present risks which the facility's design must address.

In general, the design of physical facilities should support proper collections care in three major areas: 1) security, 2) environment, and 3) protection from fire and water damage.

3.1.1 Security

Securing collections against theft or against willful or accidental damage is largely an issue of applying common-sense measures in ways that are commensurate with the value of the collection. Museum security specialists often advise museums to conceptualize security systems as concentric perimeters ringing valued objects, where perimeter security increases with the proximity of the ring to the object. In other words, the closer you get to the object, the tighter the security. For high value objects on permanent display or in permanent storage, this methodology points to clear solutions. For collections of modest value that are sometimes in storage, sometimes on display, sometimes loaned to other institutions, sometimes in a conservation studio, and sometimes in a board room, the concept of creating pure security perimeters is much less clear cut.

In addition, collection security is significantly dependent upon architectural configurations of the museum and must be part of a thoughtful analysis of spatial options. Security issues that can't be solved with physical measures can often be solved with electronic or operational methods and therefore they must be developed hand in hand as the design progresses.

The following sections of this document refer to four general levels of security to be considered for individual spaces. The four levels include “university standard” (where no special museological concerns are thought to apply and university standards are a reasonable default minimum) and three other levels designated low, medium, and high security where specific security measures should be considered to address museological concerns. However, these classifications are preliminary recommendations and the involvement of a security consultant in the development of the design is highly recommended.

3.1.2 Environment

The air quality, light levels, temperatures, and humidity of the environment where a collection object resides have a significant impact on the long term preservation of the object. Extreme levels or rapid fluctuations in these conditions can be destructive to the structural or surface integrity of objects.

In general, damage from contaminants in the air or high levels of light is cumulative over time and in magnitude of exposure. For example, exposure to light level x over time period y causes the same level of damage as a level of $1/2 x$ over a time period of $2y$. Both particulate and gaseous contaminants in the air can be detrimental to collection objects over time. To properly address this issue, air sampling should be done at the project site, contaminants measured at various seasonal highpoints and filters specified to remove those contaminants that are harmful to the collections (and occupants). Also, as the project design progresses, care should be taken that materials used in construction, or in the systems used for heating and humidifying, do not contribute negatively to indoor air quality. Steam humidification in particular (if used) should be carefully checked to be sure that system additives do not introduce damaging levels of amines into the air stream.

Light in the ultraviolet and infrared ranges is particularly damaging to objects with UV being the worse of the two. For this reason, many collection objects cannot tolerate exposure to sunlight or fluorescent lighting without sustaining damage and therefore natural and artificial light levels in a museum must be carefully controlled. However, full spectrum daylight is unsurpassed for rendering color and surface detail in objects and if properly controlled can be a terrific ally in dynamic exhibition of objects and in green design strategies (see Section 3.3.1 for more on this issue.)

Generally speaking, stability over time (and within narrow ranges) in levels of humidity and temperature are essential to proper collection care. However, different types of objects require different ranges based on the materials that comprise them. Relative humidity levels that are too low create static

electricity and dessication of certain objects, whereas levels that are too high can create condensation and contribute to mold growth. Ranges recommended in this document are the result of discussions with curators, University facilities staff, and present storage conditions. It is recommended that the Museum conduct an object condition report and conservation assessment survey to verify these initial ranges.

It is important to recognize that the proper environment for collections must be maintained on a 24/7/365 basis and system redundancies and emergency back up provisions are required to safeguard the constancy of the conditions. Mechanical systems and their controls must be designed to accommodate and protect the collections. Standard life cycle calculations or economizer cycle assumptions may not apply.

As a general rule, humidity levels for a museum in Utah are generally higher than outdoor ambient levels for most of the year and therefore moisture migration is an issue. Humidity will migrate from areas of higher condensation to areas of lower concentration in the form of water vapor. Within the Museum this implies that areas where higher humidity is desired will likely require enclosure and separation from areas where it is not. It also means that the exterior building envelope will need careful detailing of air barriers and vapor retarders to prevent humidified interior air from penetrating exterior wall assemblies and condensing. If not properly controlled, this condensation in building cavities can cause significant damage via rusting, staining, and spalling of exterior wall materials.

Creating an interior environment of constant, but different temperatures and humidity requires mechanical systems and controls that are more specialized than standard and therefore more expensive to install, operate, and maintain. Because of this expense, larger museums typically establish zones where separate, less sophisticated systems can be used and where the patterns of use do not require constant system operation or such narrow ranges of control. (Note: We intend to opt for a separate system that can provide up to 50%rh for the changing exhibit galleries. These two adjacent galleries will be situated in the building away from exterior walls and without windows to avoid condensation problems that would arise from the more moist air in these spaces.) UMNH's mechanical engineers and architects should review this issue as the design develops.

3.1.3 Protection From Fire and Water Damage

The selection of fire protection systems in museums often comes down to the selection of the lesser of two evils: the unlikely damage from an accidental sprinkler system malfunction is

preferable to the devastation of an unlikely fire. Hence, sprinkler systems are recommended for UMNH throughout the new building.

However, to help mitigate potential problems with accidental discharge of water in collection areas, this report recommends pre-action, dual interlock sprinkler systems (also known as “dry-pipe sprinklers”) in all areas where collection objects have potential exposure. (There is one exception to this and that is the Biological Fluid Collections Storage area where a gas suppression system (Inergen) is recommended because of the special nature of the stored materials.) Special review of this area with the presiding Fire Marshall during the design phase is strongly advised.

To prevent potential water damage from other sources, it is recommended that no pressurized water piping for plumbing or mechanical systems be routed through or over areas where collections are exposed. Also, roof drain clean outs should be planned to avoid collection areas, and collection spaces should not be located in areas that are subject to flooding.

UMNH will require 5-year service contracts from the construction contractor for maintenance and service of pre-action sprinkler systems and Inergen gas suppression systems.

3.2 Visitor Experience

Part of the mission of UMNH, and any museum open to the public, is to provide positive, edifying experiences for visitors that encourage greater involvement and repeat visitation. Obviously, the building's architecture can contribute a great deal to creating this positive experience.

From distant views of the building to experiences had from arrival to departure, consideration of visitor comfort, ease, and safety must infuse every aspect of the design. It must be recognized that UMNH will serve a broad and diverse audience all of whom arrive with different levels of experience, expectations, and learning capacity.

Visitors will arrive in groups via bus, as families in cars and as students on bicycles. Age groups will vary from pre-literate children to world-traveling seniors. The Museum will accommodate early morning breakfast meetings and late night star-gazing that extending its schedule of use beyond the 9 to 5 hours. Visitors will seek contemplative personal experiences; self-guided exploration; docent-led group tours; highly interactive learning labs and a forum for lively debate. To be successful, the building must welcome all with grace, hospitality, and unique experiences.

The Interpretive Master Plan that is part of this document describes in greater detail the experiences proposed for visitors in the major public program spaces and outlines a multi-valent menu of learning experiences that emanates outward from the collections.

The architecture that frames the interpretive plan must provide effective and coherent transitions between components that will accommodate surges in the number of visitors, create dramatic experiences and reflect the personality of the institution. Orientation and wayfinding must be clear and intuitive, but not so emphatic that it doesn't allow visitors to amble and explore at will within the Museum's interpretive trail system.

The Museum will have a "free zone" at the entry that clusters all of the visitor services facilities around the Lobby as a central hub. The free zone will be the arrival and departure location for all visitors to the Museum. Publicly-accessible areas will be accessible without purchase of an admission ticket.

The "paid zone" of the Museum will include all the public program areas described in the Interpretive Master Plan and will be accessible based on Museum membership, on purchase of admission, or by complimentary admission. In each case, access will be checked at an admission control point.

At the juncture between the free zone and the paid zone, an orientation theater will provide an optional introductory overview of the Museum for visitors. The theater will also be used for other functions such as lectures and distance learning. It should be located to allow it to function as either a part of the free zone or a part of the paid zone depending on its programs and audiences.

Both interior and exterior public spaces in the Museum will provide unique venues for special events. These will include Museum activities like fundraisers

and scout sleepovers as well as revenue-generating rentals like birthday parties, corporate events, and perhaps even weddings. The ability to create positive visitor experiences for special events is part of the unique profile of successful museums and requires thoughtful design attention to flexible systems and arrangements of space.

3.3 Integration of Exhibits

The successful integration of exhibits into museum architecture lies in a well developed exhibit design and supporting infrastructure systems that balance future flexibility and unique spatial drama.

The Museum's exhibits will change over time; some of them on very short cycles to keep pace with current science and technology. Others of a more timeless nature will change more slowly, and still others may become favorite icon exhibits that will be hallmarks of the institution for generations. Recognizing and distinguishing where flexibility is a key issue or where architectural tailoring of the building to specific exhibit experiences is paramount will be an essential part of the Museum's design.

The Museum's inaugural exhibit design will use many tools and techniques to reach the broad needs of its audiences. There will be collection objects displayed for their pure aesthetic appeal; there will be didactic text panels; photographic murals; interactive exhibits using optical, mechanical, and electronic devices; live demonstrations; distance learning facilities; and cultural and theatrical performances. Providing the architectural setting for these activities requires that the exhibit design, be an integrated part of the building's design process. Exhibits should not be regarded as furniture to be moved in when the building design is complete.

A few general guidelines to help integrate exhibits include the following:

- To understand the exhibit techniques to be used. Do not assume every exhibit is a "black box" space.
- To maximize flexibility, minimize the number of permanent architectural features like structural columns, shear walls mechanical shafts, stairs, and elevators in the middle of exhibition spaces. Keep them out of exhibit spaces or locate them at the perimeter.
- Provide natural light judiciously and control it completely. Recommended light levels for conservation of objects are typically in the 15 to 20 foot candle range with some special areas in the less than 10 foot candle range. Clear skies and full sun provide almost 10,000 foot candles. Size windows and skylights in exhibition areas with this in mind.
- Provide electrical power and data cabling in floors, walls, and ceilings. Generally, cored floor outlets are preferred to underfloor power ducts or raised "computer floors." Scissor lift and fork lift usage in the Museum can crush concealed floor ducts and computer floors will not support the weight. Design for power and data shall provide maximum flexibility to allow the Museum to reconfigure the Changing Gallery spaces to combine them and/or subdivide them. A floor-to-ceiling modular grid wall system on tracks should be considered for this purpose.
- Maximize the ability to have flexible incandescent track lighting in the galleries. Good exhibit light often uses multiple lamps and lighting angles. Fluorescent lighting is not recommended for exhibit material and collection objects on display.

- The ability to hang exhibit materials from walls and ceilings and to change this over time will be important in many exhibition spaces.
- Understand the role of the ceiling in each exhibit area and treat it accordingly. It will require different design approaches if it is to disappear into darkness or provide a visual backdrop for a suspended artifact.
- Along with power, data access needs include that which will maximize the ability to reconfigure the changing gallery spaces to combine them and/or subdivide them for greatest level of flexibility. Power and data ports should be provided in the observatory galleries to serve interactive and data intensive exhibits. These needs should be carefully coordinated with the exhibit design. A floor-to-ceiling modular grid wall system on tracks (ala the San Francisco Museum of Modern Art and others) should be considered for this purpose.

4.0 TOTAL FACILITY BUILDING ANALYSIS

4.1 Architectural Planning Issues

4.1.1 Building Form and Massing

4.1.1.1 Freedom and Opportunity

As indicated in the site analysis section of this document, there are relatively few external site factors that dictate specific responses in terms of the form and massing of the Museum's new building. The relative lack of height restrictions, setback requirements, envelope limits, and view corridor restrictions from neighboring structures presents significant creative freedom in shaping the building's form and massing.

In fact, the site presents a situation where the architectural design effort will be much more an exercise in optimizing and maximizing opportunities than it will be one of minimizing the negative impact of externally imposed restrictions. The biggest design challenges will likely be created by economic factors affecting the project.

It should be noted that economic factors such as available design and construction budgets, timing of funds, and on-going operational costs that typically drive most buildings toward maximizing functional efficiency, modular construction, identical floor plate sizes, vertical stacking of utility cores, etc. must be balanced in a museum building with the museum's need to engage, delight, and intrigue visitors in order to be successful. In other words, to be successful, a museum's functional efficiency must be at least matched (and preferably exceeded) by its ability to draw visitors. Visitors are drawn to museums because of the non-typical experiences they offer and this often requires not-typical building strategies.

4.1.1.2 Footprint, Location, Orientation

The three-dimensional issues of form and massing are critically effected by the two-dimensional issues of the building's footprint, location, and orientation. The earlier section on site analysis outlines the critical parameters affecting these issues.

At 169,000 gross square feet of proposed building area, and approximately 80,000 gross square feet additional for a 200-car parking structure, the museum's total built area of almost 250,000 gsf represents only about 32.5% of the total site area of 14 acres. It is clear that the building footprint is not restricted by the site's perimeter boundaries. The buildable area of the site is, however, reduced by the presence of the pipeline easement, the Shoreline Trail, existing greenery (if it is to be preserved), and steeply sloping area of the site.

At the time of this writing, the option of relocating the pipeline is being discussed as are the possible options for providing parking; either a) beneath the new building, b) in a separate linked structure, or c) as a surface parking lot. The permutations of these options and their impact on building footprint location

and orientation, and ultimately on form and massing, are myriad. Therefore, for the purposes of this document, it is assumed that 1) the cost of moving the pipeline will be prohibitive and will not substantially alter the issues driving building form, and 2) the preferred option for parking is to locate it beneath the building in order to preserve open space on this site.

4.1.1.3 Massing and Form

External factors affecting building massing include: the slope of the site, the preliminary indication that rock substrate exists approximately 20 feet below the surface throughout the site, and the remarkable views from almost every location on the site.

The internal factors that drive building massing include:

4.1.1.3.1 Mission Made Visible

The Museum's mission should be manifest in the building's architecture. When new visitors approach the building, there should be no doubt in their minds that the building is the home of the Utah Museum of Natural History.

4.1.1.3.2 Parking

Parking one's car at the Museum should be considered part of the visitor entry sequence and should be designed to be convenient, accommodating, and consistent with the Museum's public mission. The parking should be designed as a positive experience and opportunities should be exercised to use the parking area as a tool to reinforce the Museum's mission. Including murals, framed views, geologic interpretation or architectural drama in the parking area are options that should be considered during the design phase.

If the parking area is located beneath the building as proposed, its structural system should be as efficient as possible and column bays established to be compatible with Museum spaces above. Transfer beams drive up project costs and structural depth, and therefore their use should be minimized. Creative marrying of the parking structure system with the Museum spaces above can help contain structural cost and provide a simple armature for a more sculptural architectural approach above.

A passenger elevator and stairs should connect the parking levels with the Museum's main lobby free zone. For reasons of fire hazard separation, visitor comfort, and elevator cycle times, it is recommended

that this elevator serving parking zones not extend to floor levels above the main entry level. The design shall consider options for vertical transportation to separate staff from visitors primarily to control non-public space access.

The placement of parking beneath the Museum should be reviewed in light of University security policies in place at the time of design.

4.1.1.3.3 Lobby

The lobby is the arrival and departure zone for visitors to the Museum. It is a large volume that acts as a gathering, orientation, and special events space. It should help visitors understand the options that are available to them, should allow them to see one another engaged in Museum activities, and should create architectural drama that celebrates arrival at the Museum and prepares visitors for the experiences to come. The lobby is one of the unique signature spaces of the Museum and its expression in the building's exterior form and massing has strong potential as an iconic architectural element.

4.1.1.3.4 Minimize Number of Levels

In general, the public areas of the Museum can most conveniently and economically be served by having as few floor level changes as possible. Family visitors often have strollers and groups of visitors in wheelchairs are becoming increasingly commonplace in museums. In addition, exhibition spaces will often require service access with forklifts or manlifts. Because floor to floor heights in museums often exceed 18 feet (as a typical minimum), ramps between floors can be lengthy and use up valuable floor space. Conversely, multiple elevator banks can drive costs up significantly. Therefore, it is strongly suggested that the public areas of the Museum not be distributed on more than three floor levels (excluding parking levels, outdoor spaces, and potential roof top terraces.)

The impact that this limitation on number of levels may have on form and massing is to put a stronger emphasis on the building's horizontal proportions and less emphasis on vertical or tower-like proportions.

4.1.1.3.5 Compact Volume

A number of factors combine to suggest that the Museum's new building should be compact in its

massing. Issues such as energy efficiency, material efficiency, and preserving open space and existing greenery by limiting the footprint are among the critical Green Design considerations. The Museum's strong desire to foster staff collaboration and cross-disciplinary interaction also suggest massing strategies that keep staff in comfortable and close proximity to each other. Finally, issues of operational and economic efficiency further suggest a building where corridor lengths are minimized and final design adjacencies are optimized.

However, this programmatic and functional inclination toward compactness should not be used as an argument to strip the building of character or to deny it a unique architectural personality. The building should be an icon worthy of the Museum's highest aspirations.

4.1.1.3.6 Interpretive Concept

As described in the Interpretive Master Plan, the creation of a 3-story stack of collection storage areas wrapped with interlinked public program areas (labs, classrooms, and exhibition areas) suggests an ascending spiral form. Also, since the collection spaces are most effectively used as single height spaces and adjacent exhibition spaces are typically double height or higher, the exhibition space will step up in single levels (or half their double height) and will create positive opportunities for balconies and overlooks between exhibition galleries.

4.1.1.3.7 Viewsheds

The site affords spectacular views in multiple directions. Museum spaces should be massed to frame these views and capitalize upon them. Exhibit spaces in particular will use specific viewsheds as focus elements of the Interpretive Plan. A building form which accommodates multiple orientations to views will be essential.

4.1.1.3.8 Outdoor Access

The Interpretive Master Plan and this program call for a number of spaces to have access to outdoor areas. To avoid the extensive need for ramps and lifts, it is strongly suggested that outdoor access from the Museum be accomplished with direct horizontal access (i.e. as little height differential between adjacent indoor and outdoor spaces as possible.)

The need for outdoor access, terrace areas, and outdoor program spaces suggests building forms and massing that transition gradually to the surrounding landscape.

4.1.2 External Relationships

4.1.2.1 With the Campus

The Museum has strong academic and research ties with various university departments on the main campus. While the new location on the Bench does not move the Museum any closer to these departments, it is hoped that enhanced forms of electronic communication will mitigate the increased physical distance. Also, the physical separation from the main campus challenges the Museum to attract students and researchers with compelling facilities, convenient modes of access, and developed amenities. Fortunately, these are some of the same elements that the Museum will provide to attract the general public.

4.1.2.2 Red Butte Garden

At the time of this writing, the Museum is in the early stages of discussion with Red Butte Gardens regarding the potential for sharing various facilities. These potential areas of mutual interest should be further explored and reviewed as the Museum enters the design phase of the work.

4.1.2.3 University Research Park

With the exception of Red Butte Garden, the Museum will be surrounded by commercial enterprises within Research Park. Potential for joint use of facilities should be pursued with these entities in the design phase and beyond. For example, the Research Park enterprises may have a need for rentable venues for annual meetings or video conferencing which the Museum's facilities could provide, and in return may be in a position to provide the Museum with evening and weekend overflow parking.

4.1.2.4 Emigration Visitors District

The district is comprised of Utah's Hogle Zoo, This is the Place Heritage Park, Red Butte Garden and Arboretum, Fort Douglas Military Museum, Utah Museum of Fine Arts, and the Museum. Currently the District jointly markets itself as a destination, and a "super-ticket" may be purchased by individuals. Potential joint programming or shared services such as shuttles should be pursued.

4.1.3 Internal Relationships

The internal relationships between program components in a museum are varied, nuanced, and complex. In the simplest terms, the challenge in designing the functional relationships in a museum lies in balancing the needs of the collection with the desires of a public audience and the operational requirements of the staff. However, the permutations of these relationships expand exponentially when one considers the often competing requirements of public enjoyment and access, collections care and operational efficiency.

Further exacerbating the complexity is the fact that museums are mixed-use buildings of the highest order. Museums of any substantial size (such as UMNH) often include retail operations, food service, special use theaters, state of the art electronics, laboratories, libraries, public banquet spaces, school group lunchrooms, classrooms, fabrication workshops, and offices in addition to the “traditional” museum spaces for collection storage and exhibition galleries. Internal relationships between these components are further shaped by the intricacies of security, special environmental conditions, and needs for access and flexibility. Specific requirements for these relationships are detailed in the Individual Room Data Sheet in the next section. Noted here are general issues to be addressed in the design.

4.1.3.1 Visitors

The Museum’s audience will encompass people of all ages and backgrounds. There will be individuals, families, group tours, and spontaneously formed clusters of strangers. There will be students, scholars, researchers, and the general public. There will be one-time visitors and members who practically live at the Museum. Spaces and systems in the Museum should be thoughtfully designed for all of these visitors to feel comfortable and welcome.

Security and control systems are essential to the Museum’s success but they must be designed as a subtle and effective background presence. To be successful, the public spaces of the Museum must convey an effortless hospitality in presenting programs to visitors.

4.1.3.2 Collections

The relationship of visitors and staff to the collections has many different manifestations. In the case of visitors, access must be balanced with care and security of the objects. For the most part, the interface between visitors and the collections fall in three broad categories; 1) objects on exhibition, 2) objects viewed in study storage situations, and 3) objects that can be handled, as in “discovery” programs. These relationships are described in greater detail in the Interpretive Plan.

4.1.3.3 Staff

In the case of staff relationships to the collection, access, care, and security remain critical concerns. However, the interface between staff and collection objects happens across a different, typically more mobile, set of scenarios. The path of various types of objects through the Museum becomes critical and each segment of the path must maintain proper care and security conditions. This is true of all collection objects, but is particularly important for objects of high value on loan to the Museum from collectors or other institutions. From the moment collection objects pass onto the Museum's property, their paths and placement within the building must be established to not contribute to the deterioration of the object.

Amongst its staff and researchers, the Museum actively seeks to foster cross-disciplinary collaboration. Adjacencies listed and diagrammed in this report are intended to encourage creative interactions between departments, disciplines, and individuals. Every opportunity that can be seized in the design phase to encourage the Museum staff to be a "community of the collective curiosity" should be taken. Natural pausing and interaction points within the building should be designed to support frequent casual encounters and sharing of ideas between staff.

4.1.4 Circulation

4.1.4.1 Internal Circulation

The Museum's interior circulation has both public and back-of-house aspects. In general, the public side is concerned with ease of access, orientation, wayfinding, and spatial drama. The back-of-house circulation is characterized by efficiency, directness, and opportunities for staff interaction.

4.1.4.2 Public Circulation

The public aspect of the Museum's circulation has two broad subsets: the free zone circulation and the paid zone circulation. In the free zone, the circulation is characterized by openness and simultaneous visual access to main Visitor Services features (ticketing, cafe, museum store, main entry, access to parking, entries to program spaces, etc.) In general, it is best from a cost control standpoint if all of the public, free zone spaces (with the exception of parking) are on the same floor level thus obviating the need for elevators or ramps.

Crossing from the public free zone to the public paid zone will be through a control point that will need to be reconfigurable based on various visitation scenarios. For this reason, permanent turnstiles are not recommended. Having personnel present to check access will be the most likely and flexible scenario in the near future. To avoid staffing multiple locations, there should be one threshold control location between the free zone and paid zone and any equipment or furnishings using in access checking should be movable.

A much lower volume of public access will be required to staff work areas. It is recommended that this access be managed by the main ticketing desk, and staff escorts provided to a secondary lobby/reception area serving staff work areas. For reasons of collection and general security, non-staff users of the building should always be escorted while within non-public areas of the building.

Within and between public program spaces in the paid zone, the internal circulation should support the types of access and the system of trails described in the Interpretive Master Plan. In concept, the trail system is three concentric rings of circulation that emanate from a central core of viable collection storage spaces. By choosing one ring or another or combining parts of the rings, a visitor can "customize" their path and their experience through the museum.

The trail system will present two primary challenges to the Museum's design. First will be the coherent and economical integration of vertical circulation into the trail concept (think strollers and wheelchairs.) Second will be the integration of outdoor experiences to allow visitors to pass from humidified,

temperature-controlled exhibition space to open air (without creating interior climate swings that are deleterious to collection care standards or compromising security or breaching admission control) will require careful placement of exterior doors and buffer zones such as vestibules.

In general, main passages for visitors that link the public program spaces (as well as free zone spaces) should not be less than 10' in vertical or horizontal dimension. The number of public elevators within the paid zone will ultimately be determined by the arrangement of public program spaces. Accordingly, there may be opportunities for elevators serving staff areas of the Museum to be shared with public use elevators or vice versa. At minimum, the public program spaces should be served by at least two passenger elevators accommodating 12 to 15 people each. If passenger elevators are to do double duty as service access to galleries and collection areas, the requirements listed below for the freight elevators should govern their design.

4.1.4.3 Staff Circulation

Generally speaking, staff circulation within the public areas of the building can follow the same paths as provided for the Museum's visitors. In non-public areas of the building, corridor widths and heights should be 10' minimum and should accommodate movement and turning of 20' long objects where forklift access and large object movement is required, and should be 6' wide in other areas. Any freight elevators provided should have 10' high by 10' wide by 20' deep interior dimensions and should have a weight capacity of 14,000 pounds.

4.1.4.4 External Circulation

Refer to the Interpretive Plan and the Site Analysis sections of this document for descriptions of external circulation issues.

4.1.5 Personnel Interaction

The requirements for public contact varies greatly across the spectrum of the Museum's staff positions. Educators, security personnel, and membership staff may require an extremely high degree of daily contact with the public, whereas the Museum's carpenters, accountants, and technicians may have almost none. These relationships are generally reflected in Section 5 of this report. Staff/public interaction within public program spaces in particular is described in greater detail in the Interpretive Master Plan.

The Museum has expressed a strong desire to "break down the - ologies," or de-compartmentalize scientific understanding, in the Museum's presentations to the public. The intent here is not to turn the Museum's highly trained specialists in generalists, but to seek unifying connections between various branches of inquiry. Physical patterns within the building can do a great deal to foster these connections.

Interaction between the staff is of great interest to the Museum. Interdisciplinary collaboration is essential to the success of both the Museum and the University. It is a critical component of the future of the institutions and their research endeavors. Wherever possible within the Museum, the arrangement of spaces and the circulation between them should foster casual and constructive interaction between individuals and departments.

Opportunities should be optimized to help staff be aware of each other's presence (i.e. common entry points, open work areas, transparent enclosures, work areas organized around multi-story spaces, etc.). Also, points with the building's circulation scheme that are natural pausing or encounter locations should be developed to foster collaborative work patterns and spontaneous thinking. Pausing points such as open stair landings, elevator lobbies, and drinking fountains to be enhanced with nearby seating areas, white board walls, network connections, and tack boards to encourage on-the-spot collaborative capture. The same is true for encounter zones such as copier/supply/spaces, lunch/lounge areas, kitchenettes, and even restrooms. As the building design is developed, these collaborative patterns should be carefully integrated with the more established needs for privacy, sound control, and functional adjacencies.

4.1.6 Building Security

Given the dramatically changing landscape of world and national security, it is strongly recommended that all security recommendations mentioned in this document should be reviewed and updated during the design phases of the project. In general, the project shall comply with all applicable University standards in place at the time of design. In particular, the issue of public parking below the building should be reviewed relative to campus and local standards. In addition, this document recommends a series of security measures ranging from low to high (see Electrical Section 4.3.6) that apply specifically to the Museum's operations. These, too, should be reviewed during the design phases to be sure that they are consistent and up-to-date with the requirements of the national security climate and any changes in the Museum's collections or operations.

In general, the personal security of staff and visitors is an issue of University standards and policy, and the additional requirements listed in this document relate to security of collections and museum operations. For additional detail refer to Electrical Section 4.3.6 and individual room data sheets. Since many security issues will be affected by the final configuration of the design, it is highly recommended that security system designers specializing in museums be a member of the project's design team.

4.1.7 Codes, Regulations, and Safety

The governing codes for this project listed below will need to be verified at the beginning of the design phase. Latest revisions and editions, or adopted versions, must be used. Utah Code R156-56-701 and R710; www.rules.gov/publicat/code.htm (Utah administrative code).

1. International Building Code (IBC) 2003
2. International Plumbing Code (IPC) 2003
3. International Mechanical Code (IMC) 2003
4. International Fire Code (IFC) 2003
5. NFPA 2002 Edition - 13, 72
- 5a. 2003 International Fuel Gas Code*
6. National Electric Code (NEC)* 2002 ED. STD. 70 of NFPA
7. Laws, Rules, and Regulations of the Utah State Fire Marshal
8. International Energy Conservation Code (IECC) by ICC 2003 ED.
9. Planning and Design Criteria to Prevent Architectural Barriers for Aged and Physically Handicapped (Fourth Revision, with lever hardware amendment)
10. Americans with Disabilities Act Title III, 1991 (ADA)
11. DFCM Design Criteria for Architects and Engineers
12. University of Utah Campus Design Standards
13. ANSI A117-119- 1968 Accessibility Standards
14. American Society of Heating, Refrigeration, and Air Conditioning (ASHRAE)
15. Sheet Metal and Air Conditioning Contractor National Association (SMACNA)
16. Underwriters Laboratories (UL)
17. American Society of Testing Materials (ASTM)
18. University of Utah East Campus Chilled Water and High Temperature Water Plant, Design Manual - August 2000
19. Center for Disease Control, Biosafety in Microbiological and Biomedical Laboratories

* With Utah Amendments

The above list is presented only to highlight currently applicable code issues and is not a complete list of applicable codes.

In addition, the design team will be required to coordinate their efforts directly with Campus Design and Construction (CDC).

4.1.7.1 Occupancy Calculation

When calculating building occupancy, museums generally fall into the category of "Assembly without seating/unconcentrated" under the IBC. However, the occupant/square footage factor associated with the category often does not accurately reflect true occupancy patterns and if applied without consideration of other factors will result in inordinately high occupancy levels

and unnecessary over-capacities in toilet rooms, egress stairs, and mechanical systems. To help mitigate this potential over-calculation of occupancy it is highly recommended that the designers of the Museum work closely with DFCM reviewers during the design phase and consider the following:

1. Calculate occupancy for each area of the building based upon its specific use (i.e. office, classroom, retail, restaurant, etc.) typically these are lower occupant ratios than *assembly* uses.
2. Review and recalculate the area of exhibition spaces as the exhibit design develops. Certain permanent features of the exhibit plan will likely reduce the true “occupiable” area of the space (for example, A/V support space, in-gallery storage areas, etc.)
3. Recognize that it is usually only in the public program areas of the Museum where fluctuations in occupancy will be felt. It is exceedingly rare that a Museum’s single day highest visitation (i.e. largest number of people in the museum in a 24-hour period) exceeds 1% of its total annual visitation and that at any given moment on those busiest of days, seldom is there more than 30% of that high daily total in the Museum at one time.

4.1.7.2 ADA Accessibility

The building and site will be designed to be in compliance with the Americans with Disabilities Act, Title 111, 1991 (ADA). The Utah State Building Board is adopting the following additional requirements which are a part of this program:

- All public entries to the building will be ADA compliant with automatic door operators including required vestibule doors.
- One set of accessible restroom doors shall be equipped with automatic door operators particularly vestibule doors if applicable.
- ADA compliant parking shall be addressed for this sloping site.

The University of Utah and the State of Utah have indicated that research spaces will not require workstations usable by the physically challenged. In the future, if disabled laboratory researchers are identified, the laboratory will be revised to accommodate the specific needs of the individual.

4.1.8 Safety Equipment Features

All labs requiring the use of hazardous chemicals must have chemical fume hoods for the users. The codes also require emergency eyewashes and safety showers to be located in all rooms having hazardous chemical use. The eyewash and shower should be located together so they can be used simultaneously, and must be accessible to the handicapped. Consideration shall be given to locate a floor drain adjacent to each eyewash/safety shower. In addition, a separate hand-held eye wash that can be used by someone who may be prostrate should be considered. University of Utah Campus Design Standards also require emergency eyewashes to have water tempered at 70 degrees. The design team shall work with the University and the State Fire Marshal concerning the requirements for fire extinguishers and fire blankets.

Each lab using hazardous materials should have chemical spill control stations meeting the University of Utah Campus requirements. The University Environmental Health and Safety Department should also be consulted on requirements for first aid cabinets, protective clothing for chemical spills, and emergency response information.

Vision panels will be included in most doors (enabling dangerous occurrences to be detected from outside the laboratory). Chemical storage rooms may be required to keep the storage of hazardous chemicals within the labs to a minimum.

4.1.9 Testing and Inspections

The following information defines the normal construction observation duties which The State of Utah, DFCM requires as a part of an Architect/Engineer Agreement, where they apply; and the normal testing requirements of a Testing Agency which is provided by a separate agreement between DFCM and the Testing Agency. These provisions are not limited to the following, but shall be augmented by possible additional requirements imposed by the International Building Code as referenced below.

4.1.9.1 Observations and Testing

Observation by the A/E, made on a periodic basis, satisfy the requirements of normal observations. Also included are a list of special observations and testing requirements for various types of construction. Special observations and testing are to be coordinated by the A/E. Independent testing agencies as paid for by the owner shall be recommended by the A/E to DFCM to perform the required services. All observations and testing services are intended to assist in the determination of compliance of the work with contract documents.

The requirements of this section relate primarily to customized or job fabrication and installation procedures, not to standard manufactured products. Services include reports for special inspection and tests and related actions performed by independent testing laboratories.

Specific quality control requirements for various categories of work are outlined in these criteria and are to be considered in the appropriate sections of the specification and, perhaps, on drawings where appropriate.

Observations, tests and related actions specified in these criteria and elsewhere in the contract documents are not intended to limit the Contractor's quality control procedures which facilitate his overall compliance with requirements of the contract documents.

4.1.9.2 Owner Responsibilities

Costs for normal observation duties are a part of the A/E agreement. Costs for special inspections and tests will be paid for directly by the Owner and are not to be included in the construction Contract Sum.

4.1.9.3 A/E Responsibilities

Independent testing agencies shall be recommended by the A/E and approved by the Owner. The testing agency shall provide certification to the A/E and Owner for all technicians to cover the type of work to be performed. Where the project requires some special inspection services, the A/E shall recommend the individual and/or testing agency to perform the duties listed in

these criteria. Special inspectors and testing laboratories shall be under the direction of the Owner.

4.1.9.4 Retest Responsibility

Where results of special inspection, tests or similar services do not indicate compliance of related work with the requirement of the contract documents, then retests are the responsibility of the Contractor, regardless of whether the original test was the Contractor's responsibility. All discrepancies shall be brought to the immediate attention of the Contractor. Provide a written report for all work observed.

4.1.9.5 Coordination

The Contractor and each independent testing agency engaged to perform observations, tests or similar services for the project shall be required to coordinate the sequence of their activities so as to accommodate required services without delay in the progress of the work. In addition, the Contractor and each independent testing agency shall coordinate their work so as to eliminate the necessity of removing and replacing work to accommodate observations and tests. The Contractor is responsible for scheduling times for observations, tests, taking of samples, and similar activities.

4.2 Expansion or Phasing Issues

While no space in a museum is immune to growth, the need for expansion in a museum is typically driven by one of three things:

- Growth in collections,
- Growth in public programs to address increasing visitation, and/or
- Earlier phasing decisions to defer building sufficient space necessary to address anticipated need.

Since phasing typically anticipates future expansion of physical facilities, strategies for accommodating phased construction are similar to those for expansions driven by collection or visitation increases.

Two primary strategies have been successful in planning future expansion for museums:

1. Building footprint expansion, or
2. Internal expansion by building-in future capacity within initially constructed volumes.

(Note: It is not recommended that UMNH rely on an expansion option that builds vertically on roof areas above museum spaces. Vertical expansion strategies are typically expensive and risky for museums because of the disruption in operations, reduction or loss of visitation revenue, and exposure of collections to increased risk during construction. Vertical expansion should be considered only when the options for footprint or internal expansion have been exhausted.)

If the first option described above can be accommodated on the existing site, it should be. Designated footprint expansion areas should be identified and taken into account in planning the site's access, landscaping, and utilities. (For more of this topic, refer to the Site Analysis portion of this document.)

Internal expansion can be accomplished by five primary methods:

- A. Through the inclusion in the design of open-air courtyard spaces that can be roofed over in the future to create more interior space. The capacities of the structural and mechanical systems should be increased in anticipation of the ultimate enclosed volume.
- B. In the case of collection storage (and other storage areas), by introducing high density storage equipment such as compaction shelving. (Note: This capacity has been built into UMNH's collections storage areas. Refer to individual room data sheet sketches.)
- C. By building beyond initial occupancy and retaining the additional space as lower-utilization shell space. This strategy may be useful to UMNH in exhibition areas as a cost control measure if funding for exhibits doesn't meet expectations.
- D. By "flooring over" multi-story spaces to create intermediate floors or mezzanines. Like method "A" above, structural and mechanical systems should be sized for the increased capacity. It is recommended that the Changing Exhibition Galleries for the Museum be designed with this potential in mind, thus allowing long-term expansion. This method must be carefully managed to minimize disruption and risk.

- E. Make space available by moving non-critical operations off-site. This strategy is currently being used by UMNH and will likely continue into the future as a cost saving strategy.

4.3 Building Design Criteria

4.3.1 Architectural

The primary functional goal of the Utah Museum of Natural History's new building is to foster scientific and personal discovery in the fields of natural history by both museum visitors and researchers. This goal will be served by a design which achieves the following:

- Protection and utilization of the Museum's collections.
- Fostering curiosity and interaction.
- Demonstration, by example, of Green Design strategies.
- Flexibility to adapt to change in scientific methodology and interests of visitors.
- Enhancement of the visitor experience.
- Providing facilities which support collaborative and innovative thinking and research.
- Enhancement of the reputations of the Museum, the University, Salt Lake City, Utah, and the region.

4.3.1.1 Miscellaneous Requirements

Floor-to-Floor Heights are generally higher in Museums than other building types primarily because of the need for large objects and special lighting angles in exhibition areas. Clear ceiling heights in exhibition areas should be no more than 12 feet but could be more than double that height depending on final exhibition designs. (Refer to the Interpretive Master Plan.) Long span structural beams (for column-free exhibition areas), girders and floor slabs have a combined depth of approximately 5 to 6 feet over typical exhibition spaces (spanning approximately 60 feet) resulting in a minimum floor to floor height of approximately 18 feet.

Most other spaces in the Museum can have minimum ceiling heights ranging between 8 to 10 feet and lower structural depths because of less need for long span spaces (see individual room data sheets).

Corridors and access ways should have the minimum clear dimensions of 10 feet high by 10 wide where forklift usage and public access is anticipated. Elsewhere, corridors can be 6' wide.

Service elevator platform size should measure 10 feet by 20 feet clear with a 10 foot clear height. Capacity of the freight elevator should be 14,000 lbs to accommodate a personnel and a fully loaded forklift.

Passenger elevators should carry 12 to 15 people each. If passenger elevators are shared with staff use, card key access should be used to restrict public access to staff only floors. There should be two elevators between the parking garage and the lobby (if parking is provided beneath the building), one elevator in the Museum's free zone providing

controlled, escorted public access to the administrative offices and board room, and at least two elevators serving the public program levels (perhaps more elevators depending on the final configuration of those spaces.)

Signage in public areas should be designed as a system in conjunction with the exhibition design so that there is coherent public wayfinding through-out the Museum. This should include a plan for exterior graphic displays. It is highly recommended that a building signage hierarchy be established early in the fund-raising period to control donor recognition signage.

Finishes should be selected to reflect and reinforce the unique nature of the institution, the expected longevity of the building and green design principles wherever possible. In addition, the following are recommended (see individual room data sheets for more detail):

Floors in high traffic public areas should be durable but comfortable and relatively low maintenance. Entry ways may have harder surfaces with surface mats. Exhibition areas will have numerous specialized finishes specified as part of the final exhibition design. Other public program spaces and staff work area, (except for wet uses) should use a high grade carpet tile for its flexibility, acoustic benefits, and maintenance capabilities. Wet spaces should use seamless resilient flooring. Utility spaces should have hardened and sealed (or painted) concrete floors. Toilet room floors should be solid body ceramic tile.

Walls in spaces where exhibit materials will be mounted to them should have 3/4" fire-retardant treated plywood beneath gypsum wall board. In the changing exhibition galleries and other spaces where displayed items will change over time, the gypsum wall board should be finished with a skim coat of plaster and painted to facilitate seamless repair of walls after the demounting temporary exhibitions. For pricing purposes, other exhibition areas should be treated as "shell space" with taped and sanded gypsum wall board over the plywood. In general, walls in other areas of the Museum should be either painted gypsum wall board or painted concrete masonry units depending on requirements for durability, sound separation, and finish quality (see individual room data sheets for additional requirements).

Ceiling finishes in exhibition areas should be designed to allow maximum flexibility and access to building utilities. Additional elements may be suspended from the ceiling as part of temporary or permanent exhibits, so exposed painted concrete composite structure is preferred. Fire-proofed steel structure reduces this flexibility and must

be finished with gypsum wall board or acoustic panel assemblies that allow a pre-determined system of hanger points. Suspended acoustic tile ceilings are generally not recommended for exhibition areas because of their lack of durability. Suspended fabric covered acoustic baffles provide greater flexibility and durability over time.

In collection storage areas, suspended acoustic tile ceilings are generally not recommended because of dust concerns and other issues. Painted gypsum wall board or painted exposed concrete structure are preferred for dust control and compatibility with indirect lighting systems (used in conjunction with compaction storage shelving). Also, given the desire to “showcase” the collection storage areas, and that they may be initially seen from below, the collections areas should have architecturally distinctive ceilings to enhance the perception of the collections.

Suspended acoustic tile ceilings may be utilized in other staff work areas and enclosed offices.

Lighting in the Museum should be carefully selected for true color rendition of displayed materials, proper collection care, and energy efficiency. Both natural and artificial light sources should be utilized, but care should be taken to not expose collection objects to high concentrations of ultra-violet light. In general, the UV element of both natural and artificial light can be diminished to tolerable levels by bouncing the light off surfaces with white paint having a high titanium oxide content (this includes almost all commercially available paints). Tinted glass and UV filters are generally not recommended (unless they are color neutral) because they tend to change the color temperature of the light.

Areas where collection objects are displayed or examined should have track lighting systems that maximize flexibility in fixture placement and lamp selection. For collection storage areas indirect, color- corrected, fluorescent lighting is recommended for its evenness of illumination and compatibility with compaction storage systems. Object examination areas should have incandescent lighting.

For exterior building lighting, metal halide lighting is recommended for its clarity of color and attractive rendering of building materials and greenery.

For all other building area lighting program recommendations, refer to Section 4.3.5.

The inclusion of the design team of a lighting designer experienced with large scale museums is highly recommended.

4.3.1.2 Window Treatments

As mentioned earlier, tinting of glass is not recommended in areas where color rendition is an issue. Window treatments to reduce glare and solar heat gain should be carefully selected to control quantities and duration of natural light while preserving color transmission and the site's spectacular views. Manually operated blinds should be provided in staff work areas to allow users to "tune" the light in individual spaces. Spaces where A/V presentations are made should have motorized black-out shades for full light control in addition to other window treatments.

4.3.1.3 Doors and Hardware

All exterior doors, including roll-up loading dock should be insulated. Door frames should be selected to provide concealed mounting of security system components. Wherever possible, doors should showcase indigenous, renewable wood species. Hardware should be selected for durability, compatibility with security systems, and attractiveness over time. Solid metal hardware without applied treatments or finishes is recommended.

4.3.1.4 Trash/Recycling

Ideally, to control vermin and maintain security, trash leaving the Museum must be located distant from the loading dock where collection objects on loan enter and leave the building. In situations where these two functions wind up in close proximity due to cost or physical constraints, every effort must be made to keep them as separate as possible.

Consistent with its green design advocacy, the Museum should have facilities that allow separation of recyclable materials in the trash area. The Museum's commitment in this area should at least match (and preferably lead) University policies.

4.3.1.5 Storage of Building Materials

Additional quantities of the Museum's unique building materials should be provided and stockpiled to facilitate future repair and maintenance. Space should be reserved in appropriate storage areas to store and protect these items.

4.3.2 Structural

4.3.2.1 Codes and Standards

The building structure shall be designed in accordance with the latest edition of the International Building Code (IBC). Use of this code will provide for the most current seismic design criteria. Codes and standards which apply to this project are as follows:

- IBC Code (latest edition) for the design of the building structure
- American Institute of Steel Construction (A.I.S.C.) Publications:
 - "Specification for Structural Steel Building -- Allowable Stress Design and Plastic Design", 1989
 - "Load and Resistance Factor Design Specification for Structural Steel Buildings", latest edition
 - Code of "Standard Practice for Steel Building and Bridges", 2000
 - Seismic Provisions for Structural Steel Buildings", latest edition
 - "Specification for Structural Joints Using ASTM A325 for A490 Bolts", 2000
- American Concrete Institute (A.C.I.)
 - ACI 318-02 "Building Code Requirements for Structural Concrete and Commentary"
 - ACI 301, latest edition "Specifications for Structural Concrete for Buildings"
- Precast/Prestressed Concrete Institute (P.C.I.)
 - "PCI Design Handbook", latest edition
- American Iron and Steel Institute (A.I.S.I.)
 - "Specification for the Design of Cold Formed Steel Structural Members", latest edition
- American Welding Society (A.W.S.)
 - "Structural Welding Code" d1.1, latest edition
- Steel Joist Institute (S.J.I.)
 - "Structural Specifications and Load Tables for Steel Joists and Joist Girders", latest edition
- Steel Deck Institute (S.D.I.)
 - "Design Manual for Composite Decks, Form Decks, Roof Decks", latest edition

4.3.2.2 Geotechnical Criteria

Terracon Consulting Engineers have written a preliminary geotechnical report dated November 21, 2003. The information

given in the report is based on Terracon's review of available geological maps and literature for the site, site reconnaissance, and geophysical seismic refraction and micro-tremor surveys using 12 and 24 channel seismographs laid out in 5 seismic lines across the proposed site.

The report indicates that soft to hard sandstone and possibly mudstone bedrock may be present at depths of ten (10) to twenty (20) feet below the existing ground surface. The overburden above the bedrock is comprised of alluvial and debris fan materials possibly containing boulders. Terracon has classified the site as Site Class B according to table 1615.1.1 of the IBC 2003 Code.

Although the Terracon report does not provide specific recommendations for foundation design, it would appear that if the proposed building will include below grade parking, it will be feasible to found the building on spread footings bearing on the bedrock. Bearing values and other geotechnical engineering properties would be established after further subsurface exploration or conducted using drilled borings and test pits as appropriate.

The geotechnical report also describes geological faults in the vicinity of the proposed site. One fault, known as the East Bench Fault (part of the Salt Lake segment of the Wasatch Fault Zone), is indicated to be considered as active and a potential seismic source for the site.

4.3.2.3 Basis of Structural Design / Building Standard

The design of the structural system(s) for the proposed facility shall conform to the minimum requirements of the International Building Code (IBC), the University of Utah Design Standards for Structural Engineering (Chapter 5), or the following minimum loading requirements for the Museum, whichever is the most stringent. Refer to the Individual Room Data Sheets for rooms for specific floor loading, forklift loading requirements, or other unique requirements:

4.3.2.3.1 Roof Loads

- Dead load: Self-weight of the in-place construction
- Snow load: 20 psf minimum plus Code required drift
- Live load at promenade areas: 60 psf
- Live load at assembly areas: 100 psf
- Rain-or-snow at flat roofs ($\leq 1/2"$ per 12" slope): 5 psf in addition to snow load.

4.3.2.3.2 Floor Loads

- Dead load: self-weight of the in-place construction

- Partition load: 20 psf where live load is less than or equal to 80 psf
- Live load: See Individual Room Data Sheets:
 - * Galleries, Registrar, Collection Work Areas, labs, and Lobby: 150 psf
 - Collection storage areas: 300 psf
 - Offices and classrooms: 80 psf
 - Stairs and corridors: 100 psf
 - Mechanical / electrical rooms: 150 psf
 - Receiving and loading areas: 150 psf
 - Parking for cars only: 50 psf
- Fork-Lift loading in galleries, exhibit areas, and specific work areas (non-concurrent with 150 psf live load): See Individual Room Data Sheets. Loading for fork-lift truck with a wheelbase of 48 inches with the following axle loads:
 - * Case 1: front and rear axles at 5,000 lbs each
 - Case 2: front axle at 13,700 lbs rear axle at 1,200 lbs
- Live load reduction: In accordance with the IBC Code

4.3.2.3.3 Wind Loads

- Basic Wind Speed: 90 mph
- Exposure Category: C
- Importance Factor: 1.15
- Wind pressures on the Main Windforce-Resisting System(s) and Components/Cladding shall be determined using the IBC Code.

4.3.2.3.4 Seismic Loading

- Site Class: B (soil shear wave velocity = 3,500 to 4,000 ft. per second)
- Seismic Use Group: II, $I_c = 1.25$
- Spectral response coefficients

$$S_{DS} = 120 \max^* S_{DI} - 57 \max^*$$
- Seismic design category: E*
 - *to be confirmed by geotechnical investigation
- Basic seismic-force-resisting systems
 - special reinforced concrete shear walls:
 - $R = 6.0$
 - $\phi = 2.5$
 - $C_d = 4.5$

- Analysis Procedures & Design Base Shear: to be determined in accordance with the IBC Code.

4.3.2.4 Vibration Criteria

For long span conditions, i.e. greater than 40 feet, the dynamic effects of floor vibrations should be considered. For laboratory areas with equipment of relatively low vibration sensitivity, e.g. bench microscopes up to 100x magnification, floor framing should be designed for a maximum vibration velocity of 4,000 micro-inches per second due to a person walking nearby at 100 paces per minute. For other non-sensitive areas such as administrative areas and galleries, floor framing should be designed for a maximum vibration velocity of 16,000 micro-inches per second due to a person walking nearby at 100 paces per minute.

Efforts should also be made to minimize the effects of vibration due to mechanical equipment and elevators through the use of acoustic isolators or other appropriate means.

4.3.2.5 Structural Framing System

Two alternative structural systems shall be considered and compared on the basis of functionality, durability, aesthetics and cost. Functionality considerations include load carrying ability, seismic resistance, vibration sensitivity, fire-resistance, planning flexibility for potential future modifications, and ease of integration with M.E.P. services. Durability considerations include robustness and extent of repair following a seismic event, resistance to environmental exposures, ability to resist impact and potential overloading. Aesthetic considerations include architectural appearance, depth of structure, effect on lighting, etc. Finally cost considerations include first and life cycle costs. In addition to the first cost of the framing system itself, consideration must be given to the variation in costs of the other systems due to the choice of the framing system. These cost variations include foundations, seismic resistance elements and fire-proofing.

4.3.2.5.1 Precast-Prestressed / Cast-In-Place Concrete Scheme - Option A

The first option for a structural framing scheme is a composite slab/beam system comprised of a cast-in-place concrete topping slab placed over two (2) inch deep ribbed steel decking supported on 18 inch wide by 36 inch deep precast-prestressed concrete beams spaced at six (6) feet on centers and spanning 60 feet. These beams would be supported on 30 inch wide by 36 inch deep cast-in-place reinforced concrete girders spanning 24 feet to 30 inch square cast-in-place reinforced concrete columns. The

precast-prestressed beams would be produced off-site with an initial upward camber. These beams would be transported to the site and erected upon the cast-in-place concrete girders. After erection, steel decking with dovetailed recessed flutes would be placed between the beams with 1 1/2 inches of bearing along the edges of the beams allowing the stirrups in the beams to extend up into and engage the concrete in the topping slab placed over the steel decking, thus resulting in a composite slab-beam to support the high live loading requirements. Note that no temporary shoring is required beneath the beams. As the topping slab is placed, most of the initial camber of the beams is offset by deflection due to the weight of the slab.

This framing system offers important advantages over more conventional steel framing. Among these advantages are the following:

- Super vibration control due to the mass of system and its damping.
- Inherent fireproofing vs. spray-on or GWB enclosures.
- Architectural appearance and durability.
- Ability to hang displays from the dovetail flutes of the decking.
- Depending upon the comparative proximities of the fabrication plants to the site, precast-prestressed beam may offer a cost savings vs. a conventional composite steel beam system.

In order to provide for future growth in the proposed double-height gallery spaces, cast-in-place reinforced concrete girders would be constructed at intermediate heights spanning 24 feet along column lines. As the need arises, new floors could be constructed using the previously described composite precast-prestressed beam system.

Because of the high floor-to-floor heights of the proposed structure and relatively high seismic forces, moment frames are not recommended for this building. Consistent with the cast-in-place girder system, we recommend that cast-in-place special reinforced concrete shear walls be used to resist seismic forces on the structure. For efficiency, the shear walls should be positioned so that columns occur at each end of the walls thus providing

boundary elements to contain reinforcing to resist overturning moments.

4.3.2.5.2 Composite Structural Steel Scheme - Option B

The second option for a structural framing scheme is a composite structural steel beam and girder system comprised of a cast-in-place concrete topping slab placed over two (2) inch deep 20 gauge ribbed composite steel decking supported on W36 Grade 50 steel beams spaced six (6) feet on centers and spanning 60 feet with headed shear connectors to affect composite action with the cast-in-place concrete topping slab. These beams would be supported on W36 Grade 50 steel girders spanning 24 feet with headed shear connectors for composite action. The girders would be supported on W14 Grade 50 steel columns. The W36 beams would be supplied with an upward camber which would be mostly offset after placement of the concrete topping.

This framing system would not satisfy several of the functionality, durability and aesthetic considerations as well as the precast-prestressed / cast-in-place option, but would have these advantages:

- Reduced seismic demand due to an overall mass decrease in the structure.
- Greater future flexibility to cut new openings in floors/roofs or through the beam/girder webs.
- Greater future flexibility to strengthen selected beams or girders for potential load increases by welding bottom flange cover plates to the members.

Similar to the precast-prestressed / cast-in-place framing option, to accommodate future growth in the proposed double height gallery spaces, steel girders (W36) would be constructed at intermediate heights spanning 24 feet along column lines. These intermediate girders could be installed as part of the initial construction or could be constructed as part of a future expansion. New floors could be constructed using the previously described W36 composite beam framing system.

Because of the high floor-to-floor heights of the proposed structure, moment frames are not recommended for this building. Moment frames, particularly constructed of steel, would be prone to excess drift (horizontal movements) under Code mandated seismic and wind forces. Cast-in-place

reinforced concrete shear walls or, preferably, structural steel braced frames should be used to resist seismic and wind forces on the structure. Shear walls or braced frames should be positioned so that columns occur at each end of each wall or frame in order to efficiently resist overturning moments.

4.3.2.5.3 Cost Comparison of Framing Schemes

For cost comparison purposes, the alternative structural systems can be simplified as follows for typical areas with a design floor live load of 150 psf on a 60 ft. x 24 ft. bay:

1. Precast-Prestressed / Cast-In-Place Concrete Scheme - Option A

- Floor Slab: 4" of 4,000 psi concrete over 2" deep x 20 gauge steel deck (EPICORE by Epic Metals or equivalent). 6" x 6" - W4 x W4 welded wire fabric in concrete topping. Overall floor thickness = 6"
- Floor beams (60 ft. span, spaced @ 6 ft. on centers): 18" wide x 36" deep precast-prestressed 5,000 psi concrete with 21-1/2 inch diameter draped prestressing strands plus 25 lbs. per foot of regular ASTM A615, grade 60 reinforcing steel.
- Girders (24 foot span): 30" wide x 36" deep cast-in-place 4,000 psi concrete girders with 105 lbs per foot of ASTM A615, grade 60 reinforcing steel.
- Columns: 30" wide x 30" cast-in-place 4,000 psi concrete girders with 70 lbs per foot of ASTM A615, grade 60 reinforcing steel.
- Footings a columns: 15'-0" x 15'-0" x 36" thick 3,000 psi concrete footings with 1,300 lbs of ASTM A615, grade 60 reinforcing steel.

2. Composite Structural Steel Scheme - Option B

- Floor slab: 4-1/2" of 4,000 psi concrete over 2" deep 20 gauge steel deck (2" LOK-Floor by United Steel Deck or equivalent). 6" x 6" - W4 x W4 welded wire fabric in concrete topping. Overall floor thickness = 6-1/2".
- Floor beams (60 ft. span, spaced @ 6 ft. on centers): W36 x 135 ASTM A992 grade 50 steel beams with 58-3/4" diameter x 5" long headed stud shear connectors. Provide fireproofing as required (assume 2 hour rating requirement).

- Girder (24 ft. span): W36 x 135 ASTM A992 grade 50 steel girders with 46-3/4" diameter x5" long headed stud shear connectors. Provide fireproofing as required (assumed 2 hour rating requirement).
- Columns: W14 x 159 ASTM A992 grade 50 steel columns. Provide fireproofing as required (assume 2 hour rating requirement).
- Footings at columns: 13'-0" x 13'-0" thick 3,000 psi concrete footings with 850 lbs. of ASTM A 615, grade 60 reinforcing steel.

4.3.2.6 Lobby / Atrium

Regardless of the basic structural framing scheme used for the building, the lobby atrium will likely feature special architecturally exposed structural steel. This would consist of tubular steel configured with curves and/or non-orthogonal three dimensional framing. This framing may support area of glass, canopies and other architectural features.

4.3.2.7 Foundations

Because the site is apparently underlain by bedrock, conventional spread footings bearing on the bedrock appear to be feasible. While the geotechnical report does not recommend a design value for footings on bedrock, the footings should not be greater than the following approximate sizes for each structural framing option:

- For the precast-prestressed /cast-in-place concrete framing scheme option A: 15'-0" x 15'-0" x 36" thick at each column based on a typical 24 ft x 60 ft structural bay. Footings would be constructed using 3000 psi concrete and contain about 1300 lbs of reinforcing steel each.
- For the composite structural steel framing scheme option B: 13'-0" x 13'-0" x 32" thick at each column based on a typical 24 ft x 60 ft structural bay. Footings would be constructed using 3000 psi concrete and contain about 850 lbs of reinforcing steel each.

Perimeter walls and interior shear walls and/or steel braced frames will have reinforced concrete grade beams or continuous concrete foundation walls with strip footings beneath them. Perimeter grade beams/foundation walls would have cast in shelves to support the architectural exterior wall cladding.

The lowest level slabs would likely be slabs-on-grade, although this must be verified by the geotechnical engineer. In areas where live loads are 150 psf or greater, 6 inch thick slabs-on-grade would be used with #4 reinforcing bars spaced at 18 inches on centers in each direction set at the mid-depth of the slab. In areas where live loads are less than 150 psf and no

significant concentrated loads are expected, 5 inch thick slabs-on-grade would be used with 4" x 4" – W4.0 x W4.0 welded wire fabric set 1½ inches below the top of the slab. A network of saw-cut or formed control joints would be placed in the slabs-on-grade to control and minimize shrinkage cracking. Control joints should be at least one quarter of the slab depth and spaced no more than 30 feet on centers in either direction, but should also align with the column grid. Saw-cut control joints would be cut within 24 hours of concrete placement while the concrete is still "plastic". In addition to control joints, isolation joints in the form of diamonds or circles should be installed in the slabs-on-grade at columns. Isolation joints should be the full thickness of the slab and should contain a pre-molded joint filler material.

4.3.2.8 Seismic Considerations

The proposed structure will be located at a site with a high potential for seismic activity. This will require particular attention to the design, detailing and construction of seismic resisting elements. As described under the options for framing systems, the high floor-to-floor heights coupled with high seismic forces are not conducive to moment resisting frames because of the large (stiff) elements and complex joint detailing that would be required to control drift and ensure proper behavior. It is recommended that seismic forces be resisted by special reinforced concrete shear walls or, as an alternative in the composite structural steel framing scheme, ordinary steel concentrically braced frames.

Special reinforced concrete shear walls would be considered as "special" under IBC Code because the structure is classified as a "Seismic Design Category E" building due to the high potential for significant (greater than 75% of the acceleration due to gravity) ground motion at the site. "Special" reinforced concrete shear walls must be detailed as prescribed under Section 21.7 of the 2002 ACI 318 Code. This section of ACI 318, sets out the requirements for shear and flexure, distribution of reinforcing steel and the need for boundary elements at the ends of the walls and around any openings through the walls. If the shear walls are located so that their ends are engaged by building columns, ACI 318 requirements are not onerous, thus making shear walls economically viable even for a concrete building frame system.

Ordinary steel concentrically braced frames would be designed as prescribed under Section 14 (Part I or Part III) of "Seismic Provisions for Structural Steel Buildings" by the A.I.S.C.. This document sets out the requirements for member slenderness, strength, configurations and connections. As an example of the probable size requirement for diagonal elements in a 24

ft high by 24 ft long braced frame with a “V” or inverted “V” (chevron) elevational configuration, HSS 8 x 8 or HSS 10 X 10 tubular steel sections would satisfy the requirements. For the composite structural framing scheme, the braced frames would offer significant economy as compared to moment frames due to the relatively simple detailing requirements and the fact that beams/girders would be sized for strength rather than lateral stiffness.

4.3.3 Mechanical

4.3.3.1 General

The facility will be designed in accordance with applicable National, State and Local codes. These codes include, but are not limited to State of Utah adopted Building Code, NFPA Standards and ASHRAE Guides, 2003 International Mechanical Code and the 2003 International Plumbing Code.

The spaces within the building will be mechanically heated, cooled, ventilated and humidified, where required, in accordance with the above codes, the University of Utah Design Standards, good engineering practice and collection care standards.

In general, conditioned air will be provided by dedicated custom air handling units. Central plant systems will be local, within the site. Cooling will be provided by water-cooled electric centrifugal chillers. Heating will be by gas-fired low-pressure steam boilers. Steam for humidification will be through a steam to steam heat exchanger.

Exhibit galleries, collections storage and work areas, and labs where collections are present will be continuously conditioned to maintain stable, year-round conditions, appropriate for the nature of the collection materials (refer to "Inside Design Conditions" for key). The systems serving the above will be classified as the Collections systems.

General occupancy spaces such as visitor service facilities, classrooms, theatres/lecture hall, administrative offices and non-collection public areas will also be conditioned to maintain stable, year-round conditions based on use and occupancies. This system will be classified as the General Occupancy systems.

Special systems will be provided for the labs (fume hoods, dust collection), creative services (dust collection, welding exhaust, spray paint booths), entry vestibules, loading dock, toilet rooms and kitchen exhaust as required by the program.

The building shall be designed to meet the criteria set for U.S. Green Building Council LEEDTM certification of silver minimum. See Section 3.4, Green Design.

4.3.3.2 Collections Air Handling Units

Collections spaces will be served by custom built constant air volume air handling with fixed minimum outdoor air. The units will cool, ventilate, dehumidify, humidify, heat and filter the air to the specified levels.

The air handling units will include supply and return fans, chilled water cooling coil, hot-water glycol preheat coil, hot-water glycol humidification, 30% pre-filters, 95% final filters, sound attenuators, outside air and discharge air plenums and access sections, as required. Unit will be double wall construction with no exposed insulating materials.

The location, capacities and quantities of units will be defined as the program develops further.

4.3.3.3 Humidification Control

Steam for humidification shall be generated by a steam to steam heat exchanger. This clean steam shall be distributed to the humidifiers.

Air handling units shall contain primary steam humidifiers to humidify the air to a baseline humidity of 30% RH with a range of +/- 5%.

Additional humidifiers shall be located in distribution ductwork serving all collections spaces to further humidify the spaces to the specified levels. Lower control tolerances will be required.

Piping and waste lines located over collections areas is prohibited.

Care must be taken with the selection of glass types to minimize potential condensate between different humidity levels and the outdoors. Glass mullions should include thermal breaks to prevent formation of condensation on inside surfaces.

4.3.3.4 Supply and Return Distribution System

All supply air will be distributed through sheet metal ductwork. Medium pressure ductwork shall be extended to terminal boxes from the air handling units. Low-pressure ductwork shall be extended from terminal box to air diffusers.

Supply and return air ductwork will be thermally insulated. Medium pressure (high velocity) supply air ductwork shall be wrapped. Low pressure supply and return ductwork to be acoustically lined. Ductwork will be acoustically lined with a galvanized perforated sheet metal cover downstream of all general occupancy terminal units and within 20 feet upstream and downstream of air handling units.

Terminal boxes shall be Constant Volume (CV) serving the collections areas and Variable Volume (VAV) serving the general occupancy areas. All terminal units shall have hot water reheat coils.

4.3.3.5 Chilled Water System

The building will be cooled by water cooled electric centrifugal chillers. The chilled water will be distributed via piping and pumps to the air handling units.

The system will consist of the chillers, cooling towers, distribution piping, circulating pumps (chilled and condenser water), chemical feed systems, controls, valves and accessories. Piping located over collections spaces is prohibited.

A chiller plant refrigerant purge ventilation system shall be installed per governing codes.

Variable frequency drives will be considered for the chillers to improve part load efficiency.

4.3.3.6 Steam and Condensate System

To handle the winter heating load, year-round reheat loads and humidification requirements, gas fired low-pressure steam boilers will be provided. Steam and condensate will be piped to the steam-to-steam heat exchangers, steam-to-hot water exchangers and steam-to-hot water glycol heat exchangers.

Piping located over collections spaces is prohibited.

The system will include boilers, duplex condensate return pumps, distribution piping, valves, steam traps and accessories, controls and flue stacks.

Combustion air system and ventilation air will be provided for the boiler room.

4.3.3.7 Heating Water System

Steam-to-hot water heat exchangers will convert low-pressure steam-to-hot water to support the building's heating, pre-heat and reheat loads. Heating water will be piped to the reheat coils and unit heaters throughout the building. Hot water glycol will be piped to the pre-heat coils in the air handling units.

Piping located over collections spaces is prohibited.

The system will include the heat exchangers, circulation pumps on variable frequency drives, distribution piping, reheat coils, valves and accessories, air separator, expansion tank and controls.

4.3.3.8 Mechanical and Electrical Spaces

Mechanical and electrical spaces will be ventilated through dampered intake louvers and exhaust fans. Fans and automatic dampers will be controlled to operate (be open) above a setpoint temperature, and be off (be closed) below the setpoint temperature. Also provide hot-water unit heaters to supply heating to chiller room.

Provide adequate space and access for tube bundle removal.

4.3.3.9 Automatic Temperature Control

A computer based automatic temperature control system, Direct Digital Controls (DDC) that will control multiple functions/

systems to maintain proper environmental conditions at all times.

DDC must report back to and interface fully with campus central system.

The air handling units will be provided with controls to control relative humidity (Collections Areas only), discharge air temperature, modulate supply air volume (General Occupancy units only), and optimize system energy management as appropriate.

Collection spaces will be controlled to specified temperature and relative humidity through local zone sensors.

Miscellaneous exhaust fan will be controlled through the fire alarm for smoke control and/or DDC system for occupied/unoccupied settings or thermostatic switches, depending upon application of each fan.

4.3.3.10 Sound and Vibration Control

Air handling equipment and cooling towers will be mounted on vibration isolators.

Pumps and chillers will be mounted on inertia blocks and spring isolators.

Air distribution systems will be provided with central acoustical silencers. Acoustical silencers will be "hospital" grade.

Other equipment will be treated as required to meet required control levels of noise and vibration and are not to be located next to vibration sensitive or noise sensitive spaces.

4.3.3.11 Specialty Spaces / Systems

Investigation of geothermal energy sources to occur during design.

The entry vestibules will be maintained at a positive pressure at all times through a variable volume air system to compensate for wind loads and open door conditions, thereby limiting uncontrolled infiltration of outside air.

The loading dock will be controlled by an outside roll down door and inside roll down doors to eliminate the uncontrolled introduction of outside, unfiltered air into the building. This arrangement will require good working practices.

Toilet exhaust systems shall be exhausted by dedicated fans via galvanized sheet metal.

Paint spray booth hood exhaust shall be provided with a dedicated riser and exhaust fan.

Lab fume hoods, depending on quantity and location, could either be manifolded by dedicated exhaust systems via stainless steel ductwork. Consolidate arrangement of fume

hoods. Fume hood exhaust systems are not to be manifolded with any other type of exhaust.

Workshops and the Paleontology Prep lab will be served by a Central Dust Collection System for sawdust, plaster dust, etc.

The Lobby and Exhibits Atria will be served by supply fans at the base of the spaces and dedicated smoke exhaust fans at the top of the spaces. Specialty space fans and controls will be on the emergency power system.

4.3.3.12 Filtration

A 30% prefilter and 85% after filter will be provided for General Occupancy systems and 30% prefilter and 95% final filter will be provided for all Collections systems.

Supplemental gas filtration systems shall be provided if required. Outdoor air tests should be completed and an evaluation of installed materials should be conducted to determine gas filtration requirements. It is recommended that these tests be conducted early in the design process.

4.3.3.13 Intakes

All intakes should be located away from the loading dock.
Review during the Design Phase.

4.3.3.14 Site

Location: Salt Lake City, Utah

4.3.3.15 Outside Design Condition

Winter: 0 degrees F dB

Summer: 97 degrees F dB / 62 degrees F wB

Cooling Tower: 70 degrees F wB

4.3.3.16 Inside Design Conditions

Environment	Typical Spaces	Conditions
A.1	Changing Exhibitions Galleries (requirement of loan exhibitions)	68° F +/- 2 F 40 - 50% RH
A.2	Exhibition Galleries, Lobby	68° F +/- 2 F 30 - 35% RH
B.1	Anthropology Collections	70° F +/- 2 F 30 - 35% RH
B.2	Geological Collections	68° F +/- 2 F 30 - 35% RH
B.3	Biological Collections	70° F +/- 2 F 30 - 35% RH
C	Intermittent Collection Work Areas (spaces where collections are work on for relatively short periods of time; can utilize economizer mode when collections not present)	68° F +/- 2 F 30 - 35% RH
D	General Occupancy (offices, general storage, non- collection public space)	72° F +/- 2 F 30-35% RH
E	Non-Collection Labs/Workshops/ Food Services	72° F +/- 2 F 30 - 35% RH With make-up air
F	Hazardous (wet collections and paint storage)	72° F +/- 2 F 30-35% RH With direct exhaust; fire separation

Note: Exact setpoints for each spaces will be determined during design and operation. Transitions in RH from season to season will be gradual.

Relative humidity (RH) shall remain constant year-round and not vary between winter and summer.

General occupancy space RH should not exceed 35% RH in Winter.

4.3.3.17 Outside Air Ventilation

Ventilation air shall conform to the latest ASHRAE Standard for Natural and Mechanical Ventilation. Carbon-dioxide control of outside air will be employed where applicable.

4.3.3.18 Internal Loads Criteria

In order to determine the airflow required for each space in the building, specific minimum air change rates, ventilation requirements, lighting loads, lab and office equipment and occupancies must be established during design.

Note: A concern regarding moist inside air freezing on the concrete entry pads is to be addressed during the Design Phase (heating the concrete pad to prevent the freezing is to be considered).

4.3.4 Plumbing

4.3.4.1 Site Utility Connection

The “yard” piping systems for domestic water, fire protection water, sanitary sewer, and natural gas will be extended from the site utility piping into the Main Mechanical Room. The connection point is outlined below:

Potable Water Service: New Connection point in Colorow Way

Fire Suppression Water Service: New Connection Point in Colorow Way

Irrigation System: New Connection point in Colorow Way

Sanitary Sewer: New Connection Point in Colorow Way

Storm Sewer: New Connection Point in Colorow Way

Natural Gas: New Connection Point in Colorow Way and Wakara Way

At the building entry point, building entry devices such as meters, main valves, cross connection control devices, etc., will be located. Meters shall be easily accessible. The domestic water and gas will be metered. A reduced pressure backflow preventer needs to be installed on the domestic water lines where it enters the building. Backflow prevention is to be installed on lawn sprinkler system. Lawn irrigation system to be metered separately..

Municipal water of sufficient capacity serves the site for both fire and building functions. Provide pressure reducing valves as required.

The sanitary sewer will exit the building in two locations via gravity underground piping. One of the locations will have a monitoring manhole designed to receive the laboratory wastewater stream from treatment systems prior to discharge to the gravity sewer. Treatment of the acid waste equipment will be maintained by the department.

Sanitary drainage systems are assumed to be gravity flow to the street sewer.

The storm drainage from the new building roof will connect to the site storm sewer via gravity underground storm-water piping.

4.3.4.2 Building Plumbing Systems

4.3.4.2.1 General

The layout and design of systems will incorporate criteria set forth in and conform to University of Utah Standards for mechanical engineering.

It is recommended that all pressure piped services from central distribution systems are to be equipped

with flow meters and totalizers, pressure transmitters and temperature transmitters for hot systems. I/O from these points shall be monitored by the building automation systems. This recommendation should be reviewed by Plant Operations during the Design Phase.

Pressurized piped utility systems (water, air, gas, et al.) will be routed such that they are not over galleries or collection areas.

Provide full size valve and capped outlets at each shaft/floor and at the end of each pipe rack run.

Seismic restraint and support systems shall be incorporated into the design of the plumbing systems in conformance with State and NFPA requirements.

LEED criteria and building sustainable design systems: The building will contain components and systems to qualify for a LEED Silver Rating. Plumbing systems shall comply with this requirement and shall be designed and installed to this sensitivity. In addition to standard water conserving measures, (low flow fixtures, sensor valves, metering outlets, etc.), these are specific reclaim and harvest systems part and parcel to this project. See the specific Sustainable Design and Reclaim Systems section to this narrative.

Each lab bench will have outlets at 8'-0" on center for gas, vacuum, air cold water and cup sink.

All wet benches will have one RO/DI gooseneck stainless steel wall mounted outlet faucet at the main lab sink. All wet bench sinks will have wrist blade handles for hot and cold water.

Chemical fume hoods will be piped with:

- 1/2" gas
- 3/4" vacuum
- 1/2" Process Cold Water
- 1/2" Process Hot Water
- 1" LW for cupsink

Use backflow prevention at fume hood and other lab faucets.

Each lab module will have access to an emergency shower and eyewash unit. The main sinks in the labs and in the wet classrooms will be equipped with swing type eyewash mounted on the countertop.

Provide floor drains for emergency showers.

Plumbing fixtures such as toilets, lavatories, janitors sinks, water coolers, etc. including those for handicapped use will be provided. All lab tops and sinks shall be Durcon or stainless steel. Fiberglass will not be used.

Interior hose bibbs and exterior walls hydrants will be provided. Hose bibbs should be one supply line separate from the main building to prevent introduction of hazardous substances from entering the water supply.

Restrooms will have isolation valves in 2' x 2' boxes in a pipe chase or wall of restroom.

Deep seal traps for floor drains should be used. Trap primers are not allowed.

4.3.4.2.2 Cold Water Systems

One (6") metered domestic water service will enter the building in the main mechanical room. The city service shall be protected by the installation of duplex 4" RPZ backflow (State approved) at the service post meter. Provide drains in mechanical rooms.

The service will then be piped through a two 200 gallon cushion tanks and a constant pressure integral PRV station.

Post main water meters and backflow devices, the system will be split with 1 set of backflow preventers into separate potable and non-potable water systems. The potable water system will serve the toilet areas, water coolers, kitchenette and the emergency shower and eye wash units and will not require additional backflow preventers. Traps will be required.

Laboratory service water will be common with the potable service, however, each lab sink or user shall be fitted with point of use cross connection control devices, such as vacuum breakers, pressure vacuum devices, checks, etc. This water system will serve outlets at lab benches, hoods, prep labs, glasswashing equipment, hose bibbs, make up water for the pure water pretreatment system and other lab equipment.

The non-potable water system will serve make up water for the mechanical systems (cooling towers, boilers, etc). This system will contain one 3" backflow preventer.

Water piping will be distributed at Level 1 floor ceiling to the pipe shafts and will rise in the shafts and be distributed horizontally at the ceiling of each floor. Valved and capped outlets will be provided for each lab module. In addition, locate valves in the ceiling plenum (except gas) as the services exit the shafts.

All lab sinks and hoods will have signage per IPC Code 608.8. Caution: Unsafe water, do not drink. State-wide amendments #38 to IDC code.

4.3.4.2.3 Domestic and Non-Potable Hot Water Systems

The water heaters will be located in the mechanical room. Cold water supply to the hot water systems will be from the potable water system. Design should consider the use of soft water to the water heaters to minimize calcification.

Duplex gas fired storage type water heaters will generate the hot water at 125°F. Approximate water heater sizes are 300-gallon storage and 500 gph recovery each. Hot water will be distributed to the laboratory benches, prep labs, glasswashing equipment and other lab equipment requiring hot water as well as toilet cores, kitchens, coffee areas and break areas. Cross connection control on hot water systems will match the cold water distribution philosophy. If laboratory equipment requires 180°F water for final rinse, the affected laboratory equipment will be purchased with integral booster heaters.

The hot water systems will be provided with a hot water recirculating loop and pumps originating at the hot water heaters in the mechanical room. Hot water circulating lines will terminate as follows:

- 1) Potable: within 5 ft. of last user and extend down into toilet core chases.
- 2) Laboratory users: within 15 ft. of last user.

The domestic or potable water system will supply emergency showers located at various points throughout the labs. The tempered supply to these units will be +/-85°F. The source for emergency tempered water will be the potable cold and potable hot from the potable water heaters. A specific tempering device will be installed. Emergency water loops will be circulated back to the heaters or end at use points to assure constant water turnover in the pipework.

4.3.4.2.4 Building Drainage Systems

General: The soil support characteristics are suspect according to the "Terracon Report"; that study reportedly sites "expansive soils, collapsible soils, shallow ground water....." As a preliminary condition, we propose to hang under-slab piping systems from the slab with rod and galvanized hangers to assure the underground piping does not settle due to poor soil support. This item requires input from the geotech consultant before final engineering and design of these systems takes place.

Central interior waste collection systems will be provided. A hard piped sanitary waste and vent system will service the toilet rooms, water coolers, kitchenette and floor drains in the toilets and mechanical rooms.

Extend dedicated and separate runs of sanitary drainage to the Paleo Casting, Anthropology, Geology and Paleontology Preparation laboratories. Provide solids traps for each lab sink. Floor drains from the geology labs shall be routed through a flush mounted solids and sand interceptor with floor access. The unit shall be situated in an adjacent custodial room or mechanical room with minimal horizontal pipe run to the unit.

Special Waste (isolated): A special wastewater collection of piping, vents and holding tanks is provided for the Wet Biological Collection work area. The system will serve dedicated hoods and sinks (equipped with grinder units) to collect species that contain preservatives that, in turn, cannot be discharged to the municipal sewer. The holding tank will be equipped such that truck suction pumps can remove the tank contents for safe manifest.

A laboratory waste and vent system will serve all laboratory sinks, cupsinks, hoods and the floor drains in the labs, prep lab fixtures, and glasswashing rooms.

The lab waste system will be piped separately and treated through a central pH monitoring and adjustment system, located in the basement mechanical room, and then piped to an exterior sampling manhole before connecting to the exterior sanitary waste system. The lab waste system will consist of vertical waste and vent risers located at

selected column or shaft/chase locations. Horizontal waste from labs will run in lab benches or in the ceiling below to stack locations. pH water treatment will be maintained by the department.

An interior roof drainage system will be provided. Leaders will run at the top floor ceiling to pipe chases and will be piped separately from other interior waste systems. Outfall will drain to the exterior storm drainage system.

Should the roof be enclosed with a full parapet, a secondary roof drainage system will be designed with drains located at a higher elevation than the primary system. Secondary drains will connect to the same riser (RWL) and discharge to the primary system.

With full parapet, provide through-parapet scuppers for emergency overflow.

3.3.4.2.5 Compressed Gas Systems

Natural Gas

Gas service will be brought to the building from the Utility distribution system. A pressure reducing station and meter will be provided by the utility.

A dedicated medium pressure 2 psig pressure service line will supply gas fired mechanical equipment

Laboratory Gas Use: Provide PRV station from meter to supply low-pressure service to labs and kitchen equipment. Gas piping will be run at the ceiling to shafts, rise in the shaft, and then run horizontally at the ceiling of each floor to one or two outlet locations on each floor. Valved and capped outlets will be provided for future extension. Each laboratory module will be isolated through a corridor wall mounted access panel and manual gas isolation valve for that lab module.

4.3.4.2.6 Vacuum Systems

Laboratory Vacuum: Central laboratory vacuum system consisting of duplex chemical dry duty vacuum pumps will be located in the mechanical room. The vacuum will operate at 150 to 180 Torr or 24" to 26" of mercury (Hg). The vacuum piping in each lab area will be provided with a liquid trap before connection to the central system. Piping will run from the benches, to a vacuum header at the ceiling of each floor, and then to the shafts. Piping

will exit the shafts at the Level 1 ceiling and run to the vacuum pumps.

Central Vacuum Cleaning System: Provide a duplex "Spencer" turbine and separator in the main mechanical room. Route tubular steel piping to laboratories (home run), offices (home run), galleries (home run) and corridors and conference rooms. The system will be sized for the simultaneous use of 6 outlets. (Note: Future Basis of Design discussion is required for this system. The above should be priced as an alternate.)

4.3.4.2.7 Compressed Air System

Compressed air will be supplied from duplex air compressors located in the basement mechanical room. The system will consist of 2 dry rotary screw oil free air compressors. A receiver tank, filters, refrigerated air dryers, and pressure reducing station shall be provided. Air will be clean, oil free and dried to a dewpoint of 39F. Piping will run to the shafts and extend to the laboratory floors at a distribution pressure of 125 psig. Compressed air will be regulated through local PRV's (per lab module) to 15 to 30 psi and will be available for lab bench outlets and hoods and benchtop use.

125 psig air will be routed to equipment requiring high pressure and also valved and capped at the entrance to each lab.

Separate air compressors will be provided for laboratory air systems.

4.3.4.2.8 Special Cylinder Gas System

A separate multi-use regional compressed gas piping system consisting of three (3) inert gas manifolds, will be provided between local cylinder storage closets and each laboratory module.

One of the above systems will be Nitrogen: Pure gaseous nitrogen, available from cylinders. N₂ service is of anticipated quality of 99.999%. Provide oxygen depletion monitors at the central storage location complete with local alarm capability and connection to the BMS.

At least one of the special gases will be CO₂.

Provide 316L stainless steel zero grade automatic cylinder manifold with fail-safe dual pressure switches and circuit board for remote alarm interfacing. System shall be capable of 2 cylinders

on each side of the system status regulator. The manifold piping shall be 316LSS welded.

4.3.4.2.9 Pure Water Systems

A bulk water purification system will be located in the mechanical room. The system will have one backflow on supply water to pure water system main supply riser, which will feed up to the ceiling of the highest level and be continuously looped through the various floors back down to the storage tanks in the basement.

Base: The system shall be piped as continuous loop modules to within 6 diameters of the use points via unpigmented polypropylene piping. The water quality at the outlet of the final treatment device is designed to meet ASTM Type III Standards.

The pure water system will consist of one basic quality level, which would, in turn, supply the next level of quality needed. The pure water system treatment devices will consist of:

- Multimedia filters (2)
- Water softener (2)
- Carbon filters (2)
- Pre reverse osmosis sterilizer (1)
- Pre reverse osmosis filters (1)
- Duplex reverse osmosis units each at 300 GPD
- Pre storage mix bed Deionizes (2)
- Pre storage UV (1)
- Storage tanks (1) approximately 500 gallons each
- Duplex pump skid
- Mix bed resin exchange service cartridges
- Resin trap filters (2)
- Final UV sterilizers (1) (254nm)
- Final filters (2)
- Programmable logic control (PLC), TOC online monitor and online resistivity monitor

The multi-media softener and carbon filters will be fixed bed type with automatic backwash cycles based on 7 day programmable timers.

There will be two dedicated pipe loops through the building with piping to within 6D of the outlet or use point. Each loop to be equipped with a flow meter and input/output to the PLC. Material of construction will consist of pure unpigmented polypropylene pipe,

fittings and valves. Support piping with continuous channel support hangers. Joints will consist of smooth butt fusion joints. Socket fusion joints or mechanical joints are acceptable. Lab bench piping (under casework) to be joined with tri-clamp system similar to "Sanitech" piping systems.

The entire system shall be sanitized prior to final system start up.

4.3.4.2.10 Sustainable Design and Reclaim Systems

Provide the following as part of the plumbing system requirements for the building in addition to the requirements cited in the balance of this report.

Dual flush water closets for all but handicap design toilet compartments.

Metering or manual faucets for lavatories at .5 gpm flow. Furnish tempering valves at each lavatory module. HW piping shall be fully circulated to each chase to assure instant access to hot supply.

The purchase of laboratory equipment such as glasswashers and autoclaves should be with options that use vacuum pumps in lieu of aspirators.

Condensate streams from spent steam to be used as pre-heat cycles for domestic and process water heaters.

Review harvesting water from clean roof drainage and areaway drains with City for appropriateness. Potential to combine this stream with reject water from the RO system and filter backwash streams from the pure water treatment system.

Collect and re-pressurize this stream. Route to the summer landscape irrigation system.

Reclaim cooling tower blowdown, grey water from lavatories, showers and condensate drains. Re-use this stream for flushing, and quenching streams for hot waste discharge such as boiler blowdown, glasswasher and autoclave wastewater quenching.

4.3.4.2.11 Hangers and Supports

All piping shall be supported from the building structure by means of approved hangers and supports. Piping shall be supported to maintain required grading and pitching of lines, to prevent vibration and to secure piping in place, and shall be so arranged to provide for expansion and contraction.

All hangers in corrosive environment areas will be

PVC coated with PVC coated rods and 304 stainless nuts, bolts and sundries. All other hangers in the remainder of the building will be normal cadmium plated sundries of copper plated on copper lines.

Support all large piping systems with necessary steel, and hardware (3" and larger) with lateral bracing, expansion joints, and guides. Restrain piping with thrust opposition structures at every major turn of 90 degrees or more.

4.3.4.2.12 Pipe Identification

All piping will be labeled with Brady Pipe markers at 20'-0" on center intervals. Color coding of markers will be per OSHA standards.

4.3.4.3 Design Criteria

4.3.4.3.1 General

The design of the plumbing systems is based upon the criteria established for the specific occupancy of the facility. Flexibility to adapt to the changing needs of the research within the specific occupancy should be addressed in greater detail in the design phase.

Domestic Cold Water: The domestic cold water will be sized utilizing the total connected water supply fixture units found in the State Plumbing Code, and adding in the total of any continuous flow demands. The system design pressure will provide 30 psi residual pressure at the highest, most remote flush valve and a maximum pressure of 80 psi to any plumbing fixture. The piping system will be sized to maintain a velocity of 5-7 feet per second within the piping system.

Domestic Hot Water: The domestic hot water system will be sized utilizing the total connected water supply fixture units found in the State Plumbing Code, and adding in the total of any continuous flow demands. The system design pressure will provide 30 psi residual pressure at the highest most remote connected fixture and a maximum of 80 psi to any plumbing fixture. The piping system will be sized to maintain a velocity of 5-7 feet per second within the piping system.

Non-Potable Water: The non-potable water system will be sized to provide a make-up water connection for the required mechanical loads.

Sanitary Waste and Vent System: A sanitary waste and vent system will be provided and sized based

upon the total connected drainage fixture units found in the State Plumbing Code. Additional flows will be calculated based upon two drainage fixture units per gpm of continuous flow. The drainage system will be based upon gravity flow and sized to provide a minimum velocity of 2 feet per second.

Storm Water System: A storm water system will be provided and sized in accordance with the city requirements for detainage. The primary roof drainage system shall be sized based on a storm of 60 minutes duration and 100 year return period. A secondary roof drainage system will be accomplished by means of scuppers.

Natural Gas: The natural gas system will be provided based upon the requirements of the 2003 International Plumbing Code and NFPA 54 National Fuel Gas Code. The piping will be sized based upon the total connected mechanical equipment load. The system will be sized to allow for a maximum system pressure drop of .5 inches of water column.

4.3.4.3 Design Criteria Laboratory

4.3.4.3.1 Laboratory Cold Water

The laboratory cold water system will be sized utilizing the total connected fixture count and adding in the additional connected equipment loads. The design pressure will provide 50 psi residual pressure at the highest connected equipment while maintaining a velocity of 4-5 feet per second in the piping system.

4.3.4.3.2 Laboratory Hot Water

The laboratory hot water system will be sized utilizing the total connected fixture count and adding in the additional connected equipment loads. The design pressure will provide 50 psi residual pressure at the highest connected equipment requirement while maintaining a velocity of 4-5 feet per second in the piping system.

4.3.4.3.3 Emergency Tempered Water

An emergency tempered water system will be provided in accordance with ANSI 358.1. The design pressure will provide 30 psi at the most remote emergency shower with a flow rate of 46 gallons per minute (representing the simultaneous use of two emergency showers and eyewash units). Distribution temperature is 85 deg F and will be allowed to degrade to ambient building temperature.

4.3.4.3.4 Natural Gas

Natural gas system will be provided to mechanical gas fired equipment only based upon the connected load. The natural gas calculation in the State Fuel Gas Code will be used to determine the adjusted design flow rates and subsequent pipe sizing. The system pressure will provide 2 psig for boilers and 7-10 inches of water column at the water heaters and kitchen outlets with a maximum system pressure drop of .5 inches of water column.

4.3.4.3.5 Gaseous Nitrogen

The nitrogen system will be designed based upon the Practical Plumbing Design Guide by James Church. The nitrogen system will be designed using 1 cfm per outlet. The Nitrogen calculation should be verified in the design phase and used to determine the adjusted design flow rates and subsequent pipe sizing. A total allowable system pressure drop of 5 psi should be used. The delivery pressure will provide 100 psi at the most remote outlet. The quality of the service will be determined per the Museum's delivery requirements.

4.3.4.3.6 Gaseous Carbon Dioxide

The carbon dioxide system will be designed based upon the Practical Plumbing Design Guide by James Church. The system will be designed using 1 cfm per outlet. Adjusted design flow rates and subsequent pipe sizing should be verified in the design phase. A total allowable system pressure drop of 5 psi will be used. The delivery pressure will provide 40 psi at the most remote outlet. The quality of the service will be determined per the owner's delivery requirements.

4.3.4.3.7 Laboratory Waste and Vent System

A laboratory waste and vent system will be provided and sized based upon the total connected plumbing fixtures by utilizing the fixture unit requirements indicated in the Special waste section of the State Plumbing Code. Additional flows will be calculated based upon two drainage fixture units per gpm of continuous flow. The drainage system will be based upon gravity drainage and sized to provide a minimum velocity of 2 feet per second.

4.3.4.3.8 Kitchen Equipment

Kitchen equipment will be determined during the Design Phase. If a grill is required, a grease interceptor or grease trap and a grease hood will also be required.

4.3.5 Fire Protection

4.3.5.1 Interior Fire Protection System

Two 8-inch fire service lines shall enter the building. Service one is to a dedicated Sprinkler Room and Service two into the main mechanical room. The services shall be tied together and preferably supplied from two separate sources on the city side and each shall be protected with an approved double detector check valve assembly.

Piping from the service header will be routed to and distributed to wet alarm valves Pre-action package systems, and dry alarm valve. The wet alarm valves feed the automatic sprinkler and standpipe systems for the common areas of the building. The dry alarm valve shall feed the loading dock automatic sprinkler system and shall be located as close to the loading dock as possible. Packaged cabinet style pre-action valve, controls, detectors, compressors, etc. shall be dedicated to each collection area and work area designated A, B or C space. Pre-action valves are regional and shall be located in rooms dedicated for such purpose.

The layout and design of systems will incorporate criterion set forth in and will conform to University of Utah standards for mechanical engineering.

Sprinkler floor service shall be provided by combined riser-standpipes and building stand-pipe service. Shutoff valves shall be provided at the base of each standpipe. Each floor shall be provided with two each of the following: a water flow alarm, isolation valve, an inspector's test for zone control. Each fire department standpipe shall have a 2-1/2" fire department valve.

Sprinkler main shall be in the egress stair enclosures where floor feeder zone stations are set up.

Sprinklers in mechanical areas shall have head guards. In mechanical areas where ductwork exceeds 4'-0" in width, sprinklers shall be provided above and below ductwork to provide proper coverage.

Provide a double check valve for the fire riser and a pump bypass system to test the fire system.

The domestic water, fire water and irrigation water system will be metered separately.

UMNH will be a state-owned facility and therefore, is included in the University of Utah Fire Marshal jurisdiction. The University of Utah Fire Marshal's office will be the liaison to the Salt Lake City Fire Department.

4.3.5.2 Sprinkler Head Schedule

Sprinkler Head Summary				
Area	Finish	Type	Link	Temp
Finish Space	White	QR - Concealed Pendent	(Glass Bulb) (Fusible Link)	165° F
Mechanical Room	Brass	QR - Upright	Fusible Link	212° F
Loading Dock	Brass	QR - Upright	Fusible	165° F
Laboratories	White	QR - Concealed Pendent	(Glass Bulb) (Fusible Link)	165° F
Kitchen	Brass	QR - Pendent	Fusible	165° F
Shell Space	Brass	QR - Upright	Fusible Link	165° F

A temporary standpipe system with 2-1/2" fire hose valves on each floor shall be provided and maintained during construction. A temporary standpipe shall be provided with a separate pumper connection.

Water supply flow tests were not available at the time of this report. Therefore, all above information is based on the assumption that adequate water supply is available for fire protection services from the municipal source.

The sprinkler systems are to be equipped with state approved cross connection control devices. The sprinkler contractor is to obtain and pay for all related permits.

Contractor shall provide a 5-year system warranty. At the end of the warranty term, the UMNH will be responsible for the system operation, maintenance and associated costs of the fire suppression systems.

4.3.5.2.1 Special Systems

Pre-action Sprinkler Systems: provide double interlock, single zone pre-action sprinkler systems in the following areas (see Individual Room Data Sheets for specific spaces):

- Intermittent Collection Work Areas
- Exhibit Galleries
- Changing Exhibitions
- Collections Storage
- Frozen Storage
- Registrar Suite
- Staging/Clean Assembly
- Receiving Area
- Crating and Uncrating
- Telephone and Electric Rooms

Gas Suppression Systems - Inergen: provide inert package gas suppression system for the following areas (see Individual Room Data Sheets for specific spaces):

Paint Booth and Paint Storage

Wet Collection Storage / Flammable Storage

IT Server Room

The above fire protection proposal is based on basic building code and NFPA requirements. Additional demands may be made by Insurance Underwriters and should be considered during the design phase.

UMNH will require 5-year service contracts for maintenance and service of pre-action sprinkler systems and Inergen gas suppression systems.

4.3.5.3 Codes, Standards, and Authorities

Local and State Building Codes and Health Department Codes:

Building Code: International Building Code and Utah State

Other Standards: National Fire Protection Association (NFPA)

Specific Client Requirements:

Occupancy: for Laboratories and Assembly Occupancy
Pre-Action Sprinkler systems

Standpipe System:

Design Pressure: TBD

Design Flow: 500 gpm at first and 250 gpm from each additional standpipe to a maximum of 750 gpm

Sprinklers - Shell Space, Administration, Office, Kitchen and Cafeteria, Conference Rooms, Auditorium, Galleries, Collection Areas:

Design Pressure: To meet end head requirements

Design Density: 0.15 gpm per square foot

Area of Operation: 2000 square feet

Hose Allowance: 250 gpm

Head Spacing: 100 square feet per head maximum

Heads: Various 165° F

Sprinklers - Laboratories:

Design Pressure: To meet end head requirements

Design Density: 0.2 gpm per square foot

Area of Operation: 2000 square feet

Hose Allowance: 250 gpm

Head Spacing: 100 square feet per head maximum

Heads: Concealed QR - 165° F

Sprinklers - Mechanical Spaces:

Design Pressure: To meet end head requirements

Design Density: .20 gpm per square foot

Area of Operation: 2000 square feet

Hose Allowance: 250 gpm

Head Spacing: 130 square feet per head maximum

Heads: Upright brass - 212° F

Sprinklers - Loading Dock (assumes interior space within parking structure):

Design Pressure: To meet end head requirements

Design Density: .20 gpm per square foot

Area of Operation: 2000 square feet

Hose Allowance: 250 gpm

Head Spacing: 130 square feet per head maximum

Heads: Upright brass - 212° F

4.3.5.4 Utility Loads and Usages

Fire Service: (Use Schedule 40 pipe as per University of Utah standards.)

Source: Municipal

Flow Demand from Municipal: 1000 gpm

4.3.6 Electrical

4.3.6.1 General Overview

A new electrical distribution system shall be provided to serve the new Museum Building.

The capacity of the electric service shall be based on the sum of the anticipated loads for all current and future loads. Provide 50% for future loads.

The required emergency/standby power loads shall be served from an on-site diesel generator. The capacity of the generator system will be based on the sum of the anticipated loads for all current and future loads.

Emergency power generator and transfer switches shall be the same manufacturer.

The UPS system for the facility shall be provided with a 5-year manufacturer warranty and service agreement.

Food service area will have a separate meter.

Codes and Standards

The electrical systems will be designed in accordance with the following local and national codes and standards as well as the local authority requirements and the requirements of local utility companies.

- American National Standard Institute (ANSI)
- American with Disabilities Act (ADA)
- Illumination Engineering Society (IES) 8th Edition
- Institute of Electrical and Electronic Engineers (IEEE)
- National Electrical Manufacturers Association (NEMA)
- National Fire Protection Association (NFPA)
- National Electrical Code (NEC) NFPA 70
- National Electric Safety Code (NESC)
- Occupational Safety and Health Administration (OSHA)
- Underwriters Laboratories (UL)
- International Building Code (IBC)
- University of Utah Design Standards
- Electrical Power Criteria

The electrical distribution system will be designed to meet the design load densities calculated on w/sf basis. The estimated average w/sf used as a basis for this narrative was 16 w/sf.

4.3.6.2 Emergency/Standby Systems Power Criteria

The emergency/standby electrical distribution system will be designed to meet the design load densities calculated on w/sf basis. The estimated average w/sf used as a basis for this narrative was 6 w/sf.

4.3.6.3 Site Electrical Distribution

Primary power for the new Museum Building will be provided from Utah Power and Light. Existing system is rated a 12,470Y/7200 Volts.

Primary Service Conductors shall be 15 kV conductors with type EPR insulation sized to accommodate anticipated load and/or short circuit duty rating whichever is higher.

Primary service conductors shall terminate at new unit substations within the building.

4.3.6.4 Electrical Distribution

The unit substation will comprise of the following:

- One transformer at 12,470/7,200 - 408/277 volts, for equipment and building lighting.

- One transformer at 12,470 - 408/120 volt for general area.

The building will require two feeds to the building with a 15 kV fused switch type SF-6 gs for each transformer.

The final location and size of each unit substation will be determined by proximity of equipment loads.

The unit substation will provide a 480Y/277 volt, 3 phase, 4 wire grounded supply and a 120/208V, 3 phase, 4 wire grounded supply for distribution throughout the building.

All substation circuit breakers shall be fixed, low voltage power air circuit breakers equipped with solid state tripping systems. Breakers shall be electrically operated. The main breaker shall include ground fault, long time, short time and instantaneous trip settings.

Equipment bus will be copper and fully rated for the prospective available fault currents.

Distribution to mechanical equipment will be 480 V, 3 phase, 3 wire via panelboards and motor control centers (MCC's): Panelboards shall be provided for packaged equipment, VFD's, etc MCC's for pumps and fans utilizing starters. All of the chillers will have reduced voltage starters.

Distribution to floors will be 480Y/277V and 208/120V, 3 phase, 4 wire to remote electric closets.

Transformer windings shall be copper windings with K-20 ratings.

Electric closets shall be provided for each 15,000 square feet. Each closet shall contain, but not be limited to the following: Provide a minimum of 50% spare capacity and space in each panel. As a minimum, MCC's and distribution boards shall be sized for 15 w/sf. Lab panels and feeders 35 w/sf.

- 480Y/277V, distribution panel.

480Y/277 volt lighting panel.

Lighting relay panel.

Three 42 pole 208Y/120 volt panels for receptacle branch circuits.

Access in electrical rooms shall be provided for replacement of the largest piece of equipment without cutting the equipment or removing walls. The rooms shall be adequately ventilated under automatic control. Electrical rooms shall be separate and physically isolated. Electrical rooms should be vertically stacked floor-to-floor. There shall not be any mechanical piping or ductwork allowed over electrical equipment. Doors for electrical rooms shall open out and have a panic bar opener.

Generally electrical distribution equipment and branch circuit panels will include capacity and expansion space for 50% future expansion.

4.3.6.5 Wiring Methods

Feeders and branch circuit wiring above finished floor shall be run in electrical metallic tubing (EMT). EMT shall be used in interior dry spaces in block walls, for fire alarm, emergency lighting system and for exposed work not subject to abuse.

Rigid steel conduit shall be installed in mechanical rooms under 8'0" in height and where subject to abuse.

Concrete encased raceway in slab, in ductbank or under slab shall be Schedule 40 PVC.

Unless otherwise specifically approved, all new wiring shall be concealed.

Set screw fittings shall be used for EMT.

The minimum conduit size shall be 3/4 inches.

The use of armor-clad (AC) cable is prohibited.

Metal-clad (MC) cable is prohibited unless specifically approved by the University.

A minimum of 20-ampere circuits shall be provided for lighting and power. All lighting and power circuits shall be kept separate from each other, with dedicated separate lighting and power panels, unless impractical.

4.3.6.6 Emergency Power

The standby generator supplies emergency power to certain building loads in the event of a normal power failure. Emergency generators shall provide power to basic building services as well as sustain HVAC levels for exhibits and collections. In the event of a normal power failure, the generator automatically starts and supplies emergency generator power to the distribution loads. When normal power returns, the

building loads are transferred back to the normal source. The generator shuts down and resumes standby status until the next power failure occurs.

To comply with the NEC. "Emergency Systems" shall be separated from other loads in a dedicated room within a 2-hour enclosure. Generally emergency power will be distributed from the emergency system transfer switch to panelboards located in two-hour fire rated emergency electrical closets located at strategic points on every level of the building.

Emergency systems: Loads defined by NFPA 70, Article 700 "Emergency Systems" will be arranged for automatic connection to the standby power source within 10 seconds. Specific loads to be further defined in the design phase.

Life Safety systems: Loads defined by NFPA 70, Article 701 "Legally Required Systems" will be arranged for automatic connection to the standby power source within 10 seconds. Specific loads to be further defined in the design phase.

Standby Systems: Loads defined by NFPA 70, Article 702 "Optional Standby System" will be arranged for automatic connection to the standby power source within 10 seconds. Specific loads to be further defined in the design phase.

The generator will be located indoors in a dedicated room or outdoors in a screened area in a weatherproof enclosure.

The engine generator shall be rated for continuous standby application. The generator shall be 750 kW/933kVA, 480V/277 volts, 3 phase, 4 wire, 60 hertz grounded.

The engine generator remote status panels shall be located in the Fire Command Center and the security office.

The capacity of fuel storage will be approximately 18 hours minimum at full load of generator unit. The fuel storage tank will include secondary containment complete with a monitoring and alarm system for leakage in the annular space. The fuel storage tank will be a 2000 gallon tank, base mounted, with a 2200 gallon rupture basin.

Fuel leakage and fuel level indication and alarms will be remotely annunciated within the building's fire alarm command center. Additional alarm and indication system will include the generator unit status, emergency and standby distribution system ground faults alarms and transfer switch status. Edit transfer switch type.

Automatic transfer switches will be dual motor operated. The transfer switch for the "Emergency System" will be 4-pole, open transition with a manual bypass. The transfer switch for the "Legally Required System" will be 4-pole, open transition with

manual bypass. The transfer switch for the “Optional Standby System” will be 4-pole, open transition with a manual bypass.

A main lug generator distribution panel will be located in the generator room. The generator distribution panel will feed the transfer switches.

The voltage for emergency/standby loads will be as follows:

- 480V, 3 phase for smoke extract fans.

- 480V, 3 phase for one (1) chiller.

- 277V, 1 phase for emergency egress lighting.

- 480V, 3 phase for chiller accessories (i.e., cooling tower, pumps, etc.).

- 120V, 1 phase for fire alarm equipment or devices.

- 120V, 1 phase for communications equipment.

4.3.6.7 Lightning Protection

Provide a UPS system (static with dry cells) with 30 minute battery/backup, to serve all IT equipment rooms.

The input shall be 480 volt, 3 phase and the output shall be 208V/120V, 3 phase, 4 wire.

The UPS shall have three (3) inputs, normal, static bypass, and maintenance bypass.

The UPS 480V, 3 phase input shall be from the on-site generator.

Specific size of UPS shall be determined during design phase.

4.3.6.8 Receptacle Power

The minimum wire size for power wiring will be #12 AWG.

Provide separate neutrals for all 120 volt circuits.

Ground fault protection for receptacles will be provided in accordance with National Electric Code requirements which includes the following areas:

- Classrooms, labs, and restrooms (within six (6) feet of sinks).

- Elevator pits.

- Elevator machine rooms.

- Roof and exterior outlets.

- Office buildings.

Each office shall have a quad receptacles and a duplex receptacle. The quad will have two circuits, a “computer” circuit and a “general purpose” receptacle. The computer circuit will have a maximum of three duplex receptacles and the general purpose circuits will have a maximum of six duplex receptacles.

The purpose is to limit the number of personal computers on one circuit to three. The “computer” circuits and “general power” circuits are the same type of branch circuit.

Dedicated neutral conductors will be provided for each individual circuit conductor. No more than three circuits will be allowed in each conduit.

A maximum of six open office work spaces will be circuited to one 8 wire, four circuit feed.

Corridors will have one duplex receptacle every 40 linear feet.

4.3.6.9 Equipment Power

Wall mounted disconnects (ratings as required) will be provided for hardwired equipment for which a local disconnecting means is necessary.

Electric heat trace shall be provided for piping as required for freeze protection.

Hazardous Area Electrical Devices: All work in the Painting Area, Wet Collections Area, and Flammable Storage Area will comply with the National Electrical Code requirements for Class 1, Division 1, Groups C and D installations.

4.3.6.10 Motors and Motor Controllers

Motor control centers will be provided in mechanical rooms when six or more motors of sufficient horsepower require starters.

Variable Frequency Drives will be provided for equipment identified in HVAC section.

Comply with the University of Utah Electrical Design Guide Standards.

Motor voltages will be provided as follows:

Motor Voltages	
Horsepower	Voltage
Less than 1/2	
1/2 and larger	480 volts, three phase

Motor starters shall be provided as follows:

Starter Types	
Motor Horsepower	Starter
1/4 and below	Thermal overload switch
1/3 to 75	Combination circuit breaker and full voltage magnetic starter
Above 75	Combination circuit breaker and reduced voltage auto-transformer starter

Motor starters shall be provided with hand-off-auto selector switch on starter.

4.3.6.11 Lighting

The major source of illumination for this project will be fluorescent lamps. These will be either rapid start T8 32 watt lamps or long compact fluorescent T5 lamps bias or compact fluorescent lamps in various wattages. These lamps will only be used where analysis indicates a life cycle cost benefit. Electronic high efficiency ballasts will be used to provide full output at reduced wattage. Accent or decorative illumination will be with incandescent lamps of various sizes, or Metal Halide lamps of various sizes. Metal Halide will also be used for high ceilings areas where fluorescent fixtures are inefficient, and outdoors for pedestrian and automobile circulation, security and accent lighting. All lamps will be 277 volt.

Use University of Utah Design Guide Standards.

The color of all fluorescent lamps will be 3500° Kelvin correlated color temperature with a minimum rendering index of 70. All lamps will meet the guidelines of the Energy Policy Act of 1992. Incandescent/Halogen lamps will be used only where necessary for specific environmental criteria. Full spectrum color corrected fluorescent lights in exhibit work areas.

Any fluorescent lighting in exhibit areas or collections work area will be provided with ultraviolet sleeves.

General fixture types for the project will include recessed parabolic downlights and troffers; recessed linear fluorescent wall washers, pendant or wall mounted indirect or direct/indirect fluorescent fixtures, and certain decorative pendant or wall mounted fixtures.

Lighting equipment in mechanical and equipment rooms shall be 2 lamp, with reflectors, 4 foot fluorescent fixtures to provide 50 footcandles of illumination on vertical surfaces of equipment.

Lighting in exhibit galleries will be as determined by lighting consultant.

Outdoor fixtures will include pole mounted cutoff type fixtures for automobile circulation and parking; pedestrian height pole mounted fixtures for personnel circulation; and ground mounted accent and landscape lighting. Wall mounted sconces will be used near each entrance or exit from the building.

Site walkway lighting shall be metal halide mounted on 10 ft. poles.

Site parking lighting shall be metal halide mounted on 20 ft. poles.

Use University of Utah Design Guide Standards.

Specific requirements of fixtures in classified hazardous or “clean” environment areas shall be as needed and/or requested by the Owner in accordance with NEC 500.

4.3.6.12 Lighting Controls

Open office areas, labs, exhibit areas, lobby, stairways, and corridors shall be controlled via Central Programmable Controller (PLCS). All areas open to natural lighting shall be separately controlled and switched. Occupancy sensors shall control base building areas as required. Programmable controller shall have manual override capability and interface with Building Automation System and EMCS. All relays etc. shall be accessible from corridors or electrical panels.

Outdoor lighting shall be controlled by one rooftop master photocell in series with programmable controllers. Provide manual hand/off and auto switches.

Individual switching shall be provided in service areas and other enclosed rooms.

Provide local switching of lighting in non-public areas.

Circuiting for all lighting shall be arranged in such a way as to separate specific lighting functions.

Exterior lighting consisting of parking lot lighting and pylon signs shall be controlled by the central lighting control system.

Controls for the lighting of the facility shall be automated and zoned wherever possible for the maximum reduction of energy consumption and compliance with the intent of the “Green Lights” standards. Controls will include occupancy sensors; programmable low voltage relays; daylight monitoring systems; time clocks, and photo sensors and dimming systems. These will be determined by space utilization and environmental requirements.

Where automated control is impractical, local switching will be provided.

Provide light dimming sensors in exhibit areas.

4.3.6.13 Emergency Lighting

An emergency lighting system will be provided to allow the safe evacuation of the building in the event of a major emergency leading to a complete loss of electrical power.

Exit lights and emergency path of egress lighting will be provided in accordance with all applicable codes. Power for such shall be provided by the Emergency system as designated within this document. Additional “Emergency” lighting will be provided in laboratories or hazardous use areas to assist personnel during a normal utility power outage. Exit signs will be LED type.

In addition, emergency lighting and outlets connected to the generator will be provided in each electric room/mechanical room.

Emergency power will be provided by local emergency panelboards located in emergency electrical closets strategically located on each floor.

The following area the emergency lighting requirements:

Minimum Foot-Candle Illumination	
Area	Recommended Average Foot-Candle
Path of Egress	1 FC minimum at floor
Exterior Egress Discharge	1 FC minimum
Public Assembly Areas	5 FC minimum at exit doors and stair stair treads and 2 FC minimum in corridors

4.3.6.14 Lighting - Illumination Levels

Unless otherwise noted, illumination levels will be selected according to the method described in the current Lighting Handbook of the Illuminating Engineering Society of North America (IES, NA). IES divides task into categories based on object size and contrast. A range of three illuminance levels is prescribed for each category. An equation using weighting factors based on worker age, importance of speed and accuracy of the task, and contrast of task to background is used to select from the 3 levels. This selected level represents a design goal for the average maintained horizontal illuminance (footcandles) at the work surface.

The lighting system will be designed by the Architect and their Lighting Consultant. At this point lighting levels and layouts have not been provided, however the following general guideline will apply for lighting levels:

Recommended Average Foot-Candle Illumination	
Area	Recommended Average Foot-Candle per IES Standards
Conference, seminar, offices	50-75
Service areas: corridors, stairways, locker rooms, storefronts, lobbies, etc.	20

Recommended Average Foot-Candle Illumination	
Area	Recommended Average Foot-Candle per IES Standards
Card files	100
Laboratories	70-100
Classrooms	65-70
Offices/classrooms/ VDT	50-60
Computer rooms with (VDT terminals)	50
Mechanical, electrical rooms	20
Walkways	1 (minimum)
Entrances	10
Exhibit Spaces	To be determined by Lighting Consultant (15-40 range anticipated)

4.3.6.15 Fire Detection and Alarm System

Fire detection and alarm systems shall be as manufactured by FCI.

The fire alarm system shall be analog, addressable with 1-1/2 hours self contained batteries and emergency generator backup power. Data gathering panels will be located at strategic points in the building. The system shall report to security office located in building #301 via the network on 2 IP address lines.

Operation of manual station or detector shall print event and time in English Language and shall activate audio/visual evaluation signals and prerecorded message, shut down air handling units, trip central station alarms, activate other required systems, and identify the alarm in the annunciator panel.

Fire alarm pull stations shall be located within five feet of every exit from the building, at every exit from each floor and no more than 200 feet apart in corridors.

Smoke detectors will be installed in corridors, common areas of egress electric rooms, telephone rooms, elevator machine rooms, elevator lobbies, elevator shafts, mechanical rooms.

Duct smoke detectors will be provided in all supply air handling equipment over 2000CFM and in the return air for equipment over 15,000 CFM.

Heat detectors will be installed in elevator machine rooms arranged to shunt trip the power before sprinkler heads are activated and they will also be installed in kitchen areas.

Combination audible and visible fire alarm units will be spaced throughout the building.

The fire alarm system will interface with the standpipe system and will monitor tamper switches at each valve.

An exterior beacon and a key repository will be located on the exterior of the building adjacent to the main entrance.

A Vesda (very early smoke detection annunciation) system will be provided to monitor the computer room.

4.3.6.16 Lightning Protection

The facility will be protected by a master labeled lightning protection system. Air terminals will be equipped with rounded point protectors and down cables will not be visible.

Down cables will be provided for the lightning protection system.

The lightning protection system will be bonded to the building ground system to provide an equipotential ground plain.

4.3.6.17 Grounding System

All feeders and branch circuits will have a dedicated grounding conductor. 120/208V feeders shall have a dedicated isolating grounding in addition to phase ground.

The building will have a ground ring 3' outside of the building envelope. The ground loop will have ground rods as well. All the electrodes will be bonded together (mechanical connection) with #4/0 cable.

4.3.6.18 Telephone and Data Systems

Telephone/data system shall consist of a minimum of two 4" minimum conduits in duct bank from existing main telephone/data manhole system to the main telephone/data equipment room. Review during the design phase.

Each closet must accommodate 18" racks for equipment wiring. Raised floor is required for ventilation/AC.

Telephone/data closets should be vertically stacked and will be interconnected vertically via 4" conduit sleeves.

A system of raceways, pull boxes, and other necessary items will be provided for telephone and data system as defined by programming.

Provide a grounding system with bus bars on isolated standoffs.

Telephone/data junction boxes shall be provided at designated locations with raceway installed between the junction box and the closest hung ceiling.

Cable tray will be distributed in corridors and into tele/data closets. Cable tray shall wrap each telecom room. Cable tray will typically be minimum 12" wide, 6" deep.

Telephone/data devices will typically have a minimum of two 3/4" conduit to cable tray.

Telephone/data closets shall have fire rated plywood backboards sandwiched between two layers of gypsum wallboard. Fire-rating stamp shall remain visible after installation.

24/7 dedicated cooling will be required.

4.3.6.19 Security System

The levels of the security system are defined as follows (see Individual Room Data Sheets for each room's requirement):

University Standard: No specific security requirements for Museum space; use the University of Utah's standard security requirements for type of space.

Low Security: Access control
Door/window contacts

Medium Security: Access control
Door/window contacts
Glass break sensors
Infrared motion detectors

High Security: Access control
Door/window contacts
Glass break sensors
Infrared motion detectors
CCTV
Access monitoring/card swipe

Empty conduits and raceways will be provided for the security system. Wiring, components and hardware will be detailed in the design phase.

Conduit and box provisions for a Card Access System will be provided on all exterior first floor main doors. Card readers will also be provided on all doors located off of the first floor lobbies and entrances off of the loading dock.

Above light emergency phone system shall be installed on site per the University of Utah Standards.

Door Card Access provisions will include box and conduit provisions to a common junction box located in a secure area with one 1" conduit to the telephone/data closet for the following equipment:

- Card reader

- Electric strike
- Magnetic contacts
- Request to exit motion sensor

Closed circuit television (CCTV) raceway provisions for interior cameras will include a box with a 1" empty conduit to the telephone/data closet. Raceway provisions for exterior cameras will include a 1" conduit for signal and a 1" conduit for power to each camera.

Emergency call box raceway provisions for interior locations will include a box with a 1" empty conduit to the telephone/data closet. Raceway provisions for exterior locations will include a 1" conduit for signal and a 1" conduit for power.

The quantity and exact location of Card Access Systems, CCTV's and Emergency call boxes will be detailed in the design phase.

The alarm and control system must comply with current University of Utah Design Guidelines at the time of design.

The security system needs to be provided as an extension of the campus access/alarm system with integrated digital video recording capability, accessible through the campus network. Audio reinforcement systems should be considered during the design phase.

4.3.6.20 Clock System

Provide a self-correcting clock comprising of:

- Clock; self-correcting clocks.
- Atomic clock system.

Additional systems not included

The following systems are not included:

- Telecommunications wiring
- CCTV Systems Equipment and Wiring
- Security Systems Equipment and Wiring

4.3.7 System Commissioning

4.3.7.1 Mechanical System Commissioning

In order to comply with 1999 ASHRAE 90.1, commission the mechanical system in accordance with the 1996 ASHRAE Guideline 1 “the HVAC Commissioning Process.” A commissioning authority will be hired directly by the State to oversee the commissioning.

4.3.7.2 Electrical System Commissioning

Complete commissioning specifications are required for this project to ensure that the product specified are tuned and adjusted properly. Commissioning shall include testing and adjusting all electrical and systems equipment, preparing documentation of the testing results, preparing O&M manuals, and providing owner training as specified in each section of the electrical and systems specifications.

4.3.8 Dust Control

Dust control will be paramount during the site work and the construction of the building. The site, located adjacent to Red Butte Garden and east of Research Park, will generate a considerable amount of dust during the non-rainy season. The Designer should address any special provisions for dust control in the contract documents. Dust shall be controlled as much as possible to minimize the impact on the existing facilities and parked automobiles. The contractor should be very aware of the prevailing wind directions and take the appropriate measures to settle the dust and minimize the wind blown migration of dust particles. One method to control dust is to routinely lightly water the areas of the site that have significant vehicular traffic and other areas that are subject to winds. A dust control plan must be filed with the State.

4.3.9 Value Engineering

The University of Utah should conduct Value Engineering Workshops with the selected Designers and/or Construction Manager at the early stages of the design process, specifically at the Schematic Design Phase and the Design Development Phase submittal stage. The VE sessions should include a presentation of the project by the Design Team, and evaluation/recommendations by the CM and Owner. The University may also invite a “cold team” to participate in these workshops.

Based on the contents of this report, several items have already been identified as options and/or opportunities to reduce the cost of the overall project. The report proposes the less expensive options.

4.4 Sustainable Design Criteria

4.4.1 Sustainable Design

The Museum's desire to present collection objects in the context of larger ideas and interrelationships is a natural extension of what current scientific technologies, research, and more holistic thinking are teaching us about our world. It is important for the Museum's reputation as an authoritative voice on the subject of natural history to set an example in its own building practices that demonstrates respectful stewardship of not only the Museum's collections but also of the Museum's site and natural resources in general.

There is currently a great interest and activity in the building and design professions to create more environmentally sound practices. While this movement has many similarities and overlaps with the energy-efficient movement of the 1970's, the new mandate is much broader in that it considers both the initial and the on-going use of resources and processing of waste that buildings and site uses impose on the environment.

Referred to as "green" or "sustainable" design and construction strategies, these efforts include everything from protection of natural site features during site preparation, to using low environmental impact materials in construction, to energy efficient design, to pretreatment of building wastes. To help building owners, users and designers better comprehend the available options, the U.S. Green Building Council has formed in recent years and has developed a certification program which recognizes outstanding performance on green issues. Entitled "Leadership in Energy and Environmental Design" (or LEED) this program seeks to develop standards for assessing how "green" a facility is and participation in the LEED certification process is one option that is available to the Museum. LEED certification typically adds cost to both the design and construction phases of the project, but the key benefit is formal recognition for adopting green strategies and potential long-term energy savings.

In general, much of the current interest in green design and construction is *not* being driven by museums, but is in response to the staggering waste associated with other building types and speculative building practices. Museums, because of their public use aspect and long life cycle (50 years and beyond), are generally built to higher standards of durability and therefore are generally much more "sustainable" than speculative office buildings for example.

Also, because the care of collection objects is paramount for museums and this care is supported by high standards for indoor air quality, museums typically rate well in green profiles that assess this aspect. Museums' collection stewardship is a 24-hour seven-day-per-week proposition therefore building planning and budgeting should reflect this. To maintain proper collection care environments, museums typically make extensive use of insulation and vapor-retardant materials that often surpass the code minimums for public assembly buildings (typical classification by most building codes).

Energy use in museums is significant and as with most buildings, reducing building loads and providing insulation are the two most significant ways that a building can be more green. There are many

other areas where the Utah Museum of Natural History can demonstrate leadership in green design. The following is a preliminary outline of opportunities that may be considered:

4.4.1.1 Sustainable Design Opportunities

1. Maximize the use of spaces. Program and design spaces, where possible, for more than one use. Multi-task the spaces.
2. Use the natural slope of the site for earth-berming strategies that reduce heat loss/gain.
3. Use controllable natural light wherever possible. Use shading devices and surfaces to diffuse and reduce light and to absorb UV. (Do not rely on shading films. They color light and can have a negative affect on the appearance of natural objects.)
4. Plan and design for a compact footprint and volume for thermal efficiency.
5. Consider the use of concrete and masonry inside the building as a heat sink to slow the transfer of heat and conserve energy. (Interviewees report the availability of subsurface sand from ancient Lake Bonneville on adjacent sites. If this sand is viable for construction, it may be worth setting up an on-site concrete batching plant as the EPA did when it built its new headquarters in Raleigh's Research Triangle in North Carolina. This strategy may reduce construction waste and fuel usage for material transport.)
6. Utilize intelligent functional zoning to allow spaces to buffer each other.
7. Consider compartmentalization of various uses to allow more efficient patterns of heating and cooling cycles. For example, consider corridor "air locks" between collection environments and the building's receiving area. Also, some public spaces may not require 24/7/365 collection-quality environments. If not, they may be able to be separated from the collection spaces during off hours and operate on a reduced duty cycle.
8. One specific challenge of the site is that spectacular views are to the west of it. Since a great deal of solar heat gain comes from this orientation, and heavy shading film on glass is not desirable, some sort of "smart wall" sandwiched between two glass curtain walls could be considered. This wall would act as a buffer to heat and light yet still maintain views from major spaces within the Museum.
9. Underground Parking - Parking beneath the building has many advantages that range from site preservation, to lower thermal reflection, to reduced light pollution.

The following are strategies that relate to specific parts of the Space Program:

4.4.1.2 Visitor Services

1. Multi-task large spaces
2. Take non-collection spaces offline after hours
3. Consider recycling grey-water from public restrooms
4. Food Services
 - a. Provide space for collecting recyclable trash
 - b. Investigate on-site composting
 - c. Consider compostable utensils and plates made from soy and corn
5. Consider ticketing systems that don't generate paper trash

4.4.1.3 Education

1. The auditorium is a large volume of space with no functional need for natural light. It can be placed deep within the building as long as exit standards can be met.
2. Consider recycling grey-water from classrooms and labs.
3. Provide fume hoods with off-hours, automatic, progressive set-back cycles.
4. Consider solar aquatic water treatment system as well as other Designer and/or Owner identified "green design" opportunities.

4.4.1.4 Exhibitions

1. Controllable natural day-lighting wherever possible.
2. Water features in exhibits (such as waterfalls in dioramas) may be of assistance in humidification strategies for collection care.
3. Exhibit rock castings, if used, may provide better thermal lag and heat sink performance if cementitious rather than fiberglass materials are used.

4.4.1.5 Exhibition Support

1. Store volatile solvents, paints, etc., only in small amounts.
2. Depending on production volume, look into resource recycling or reuse (i.e. collection of saw-dust from dust collectors as a compost material.)

4.4.1.6 Collections

1. Store artifacts requiring periodic fumigation in gasketed cases to minimize amount and lessen dispersion of fumigation chemicals.
2. Arrange collections to help buffer each other from other spaces with lower environmental requirements.

4.4.1.7 Building Services

1. Consider two (2) loading docks to separate collections transport from other materials like restaurant waste. Not only does this permit better security and minimize vermin infestation, but potentially better energy use because

equipment doesn't have to work as hard to maintain collection environments every time overhead doors are opened for non-collection materials.

2. Utilize building system automation controls at the highest level that can be reasonably maintained by staff and serviced locally. (The extent of building automation will likely depend largely on how Operations and Maintenance issues are handled between the Museum and the University.)
3. Recycle grey-water from custodial closets.
4. The type and efficiency of mechanical, electrical, and plumbing equipment and fixtures can have an enormous impact on energy use. The Design Team should investigate these opportunities through various types of equipment and systems integration during the early design phases of the Museum design.

In closing, there are myriad ways that the Utah Museum of Natural History can be exemplary on green issues. One of the key ironies and challenges of how far the Museum chooses to go is like buying organic food, you know in the long run it's probably much better for you but the up-front additional cost often associated with it gives one pause. The Museum and the Design Team should look at each opportunity for LEED points associated with the sustainable design opportunity and weigh that against the present available funding/cost and the long-range rewards, both environmentally and financially.

4.5 Project Budget

To be provided by UMNH.

5.0 INDIVIDUAL SPACE OUTLINE

5.1 Space Program and Area Summary

Utah Museum of Natural History Outline Facility Program

Summary of New Building Areas		Net Area
1.	Visitor Service Facilities	14,740
2.	Public Programs Spaces	52,500
3.	Research and Collections	31,520
4.	Staff Work Areas	19,070
5.	Building Services	13,730
Total Net Area:		131,560
Net to Gross Factor		+/- 1.3
Gross Area		169,000

Utah Museum of Natural History
Outline Facility Program

1. Visitor Service Facilities		Net Area
1.1 Lobby		7,190
.1 Lobby	6,000	
.2 Tickets/Security/Membership	100	
.3 Lockers/Payphones	70	
.4 Coats/Lost and Found	120	
.5 Special Events Storage	800	
.6 First Aid/Unisex Toilet	100	
1.2 Museum Store		1,350
.1 Museum Store	1,000	
.2 Store Office and Inventory	300	
.3 Cash Room	50	
1.3 Food Service		3,900
.1 Café Seating	900	
.2 Café Kitchen/Catering	500	
.3 School Lunchroom/Multi-purpose Room	2,500	
1.4 Public Toilets		2,300
.1 Men's Restrooms (1 @ 450 nsf and 2 @ 225 nsf)	900	
.2 Women's Restrooms (1 @ 600 nsf and 2 @ 350 nsf)	1,300	
.3 Family Toilets	100	
Subtotal Visitor Service Facilities Net Areas		14,740

Utah Museum of Natural History
Outline Facility Program

2. Public Program Spaces		Net Area
2.1 Observatories		36,650
.1 <i>Dynamic Landscape</i>	4,500	
.2 <i>Past Worlds</i>	14,750	
.1 <i>Paleontology Prep Lab (see 3.2.3)</i>		
.2 <i>Anthropology Work/Prep/Conservation Lab Area (see 3.2.1)</i>		
.3 <i>Living World</i>	8,000	
.1 <i>Biological Collections Work Area (see 3.2.4)</i>		
.4 <i>Native Voices</i>	4,000	
.5 <i>Utah Sky</i>	1,500	
.6 <i>Great Salt Lake (GSL)</i>	2,400	
.7 <i>Utah Futures</i>	1,500	
2.2 Changing Exhibitions		7,500
.1 <i>Changing Exhibitions A (combinable with B)</i>	5,000	
.2 <i>Changing Exhibitions B (combinable with A)</i>	2,500	
2.3 Classrooms		6,200
.1 <i>Rocklab (dry classroom) embedded in Dynamic Landscape</i>	700	
.2 <i>Fossilab (wet classroom) embedded in Past Worlds</i>	700	
.3 <i>Peoplelab (dry classroom) embedded in Past Worlds</i>	700	
.4 <i>Genelab (la classroom) embedded in Living World</i>	700	
.5 <i>Ecolab (wet classroom) embedded in Living World</i>	700	
.6 <i>Waterlab (wet classroom) embedded between Utah Sky and GSL</i>	700	
.7 <i>Futures Forum high tech) embedded in Utah Futures</i>	2,000	
2.4 Orientation Theater (OT) / Lecture Hall (LH)		2,150
.1 <i>OT/LH Seating</i>	1,800	
.2 <i>Projection Booth/AV/Trailtik Kiosks</i>	150	
.3 <i>Theater Storage</i>	200	
Subtotal Public Program Spaces Net Areas		52,500

Utah Museum of Natural History
Outline Facility Program

3. Research and Collections		Net Area
3.1	Collections Storage	17,700
.1	Anthropology Collections	5,530
.1	Collections Storage (organic and inorganic)	5,000
.2	Human Remains Storage	530
.2	Earth Sciences Collections (NOTE: Unprepared Specimen Storage is offsite)	6,300
.1	Collections Storage, including:	6,200
.1	Paleontology Collections	
.2	Mineralogy Collections	
.2	Vault	100
.3	Biological (dry) Collections	4,700
.1	Collections Storage, including:	
.1	Herbarium	
.2	Birds and Mammals	
.3	Turtles	
.4	Malacology	
.5	Entomology	
.4	Biological (fluid) Collections	970
.1	Collections Storage	895
.2	Flammable Storage	75
.5	Frozen Storage / Isolation Room	200
3.2	Collections Management Work Areas and Labs	6,800
.1	Anthropology Work/Prep/Conservation Lab Area	1,200
.2	Earth Sciences Work Area	600
.3	Paleontology Prep Lab	1,200
.4	Biological Collections Work Area	1,000
.5	Wet Biological Collections Work Area	400
.6	Collections Managers/Visiting Scholar Offices (8 @ 100 nsf)	800
.7	Collections Technician Work Areas	700
.1	Anthropology Technicians @ 300 nsf	
.2	Geology Technicians @ 200 nsf	
.3	Biology Technicians @ 200 nsf	
.8	Paleontology Casting Lab	200
.9	Registrar Suite	700
.1	Registrar's Office	130
.2	Registrar's Work Area	300
.3	Secure Holding Room	270

Utah Museum of Natural History
Outline Facility Program

3.3	Curators Offices and Labs -- Research Space		6,190
.1	Curator/Research Offices 8 @ 130 nsf		1,040
.2	Graduate Student Study Area (16 @ 75 nsf)		1,200
.3	Visiting Scholar Offices (2 @ 130 nsf)		260
.4	Research Labs		2,450
.1	Archaeology Laboratory	1,000	
.2	Wet Lab -- Cross Disciplinary	275	
.3	Dry Lab -- Cross Disciplinary	275	
.4	Genetics Research and Preparation Lab	900	
.5	Field Equipment Storage (see Building Services 5.1.5)		
	Subtotal		4,950
	Internal Circulation Factor @ +/- 25% of Subtotal		1,240
3.4	Shared Areas		830
.1	Shared Meeting Room/Classroom	450	
.2	Shared Copier/Printer/Supplies	100	
.3	Staff Restrooms	230	
.4	Coat Closets	50	
	Subtotal Research and Collections Net Areas		31,520

Utah Museum of Natural History
Outline Facility Program

		Net Area
4. Staff Work Areas		
4.1 Administrative Work Areas		11,710
.1 Board Suite		1,300
.1 Conference/Board Room	1,100	
.2 Kitchenette	100	
.3 Storage	50	
.4 Coat Closet	50	
.2 Administrative/Reception		770
.1 Director's Office	200	
.2 Director's Conference	200	
.3 Administrative Assistant/Reception	250	
.4 Closet	20	
.5 Staff Work Area Reception	100	
.3 Large Office Suites (4 @ 720 nsf) (Community Relations, Development, Education, Exhibits) Each Includes:		2,880
.1 Large Office @ 180 nsf		
.2 Small Office @ 100 nsf		
.3 Shared Work Space for 4 @ 340 nsf (85 sf each)		
.4 Storage @ 100 nsf		
.4 Small Office Suites (3 @ 680 nsf) (Education, Operations Manager and Accounting, Graphic Design) Each Includes:		2,040
.1 Office @ 130 nsf		
.2 Shared Work Space for 6 @ 450 nsf (75 sf each)		
.3 Storage @ 100 nsf		
.5 Information Technology		1,080
.1 Office @ 130 nsf		
.2 Shared Work Space for 5 @ 500 nsf (100 sf each)		
.3 Storage/Set-up @ 100 nsf		
.4 Servers @ 150 nsf		
.5 A/V Room @ 200 nsf		
.6 Intern/Work Study/PT Hourly and Contract Work Areas (2 @ 400) Each Includes:		800
1. Shared Office Space for 5 @ 400 nsf (80 nsf each)		
.7 Education/Community Relations Storage		500
Admin Work Area Subtotal		9,370
Internal Circulation Factor +/- 25% of Subtotal		2,340

Utah Museum of Natural History
Outline Facility Program

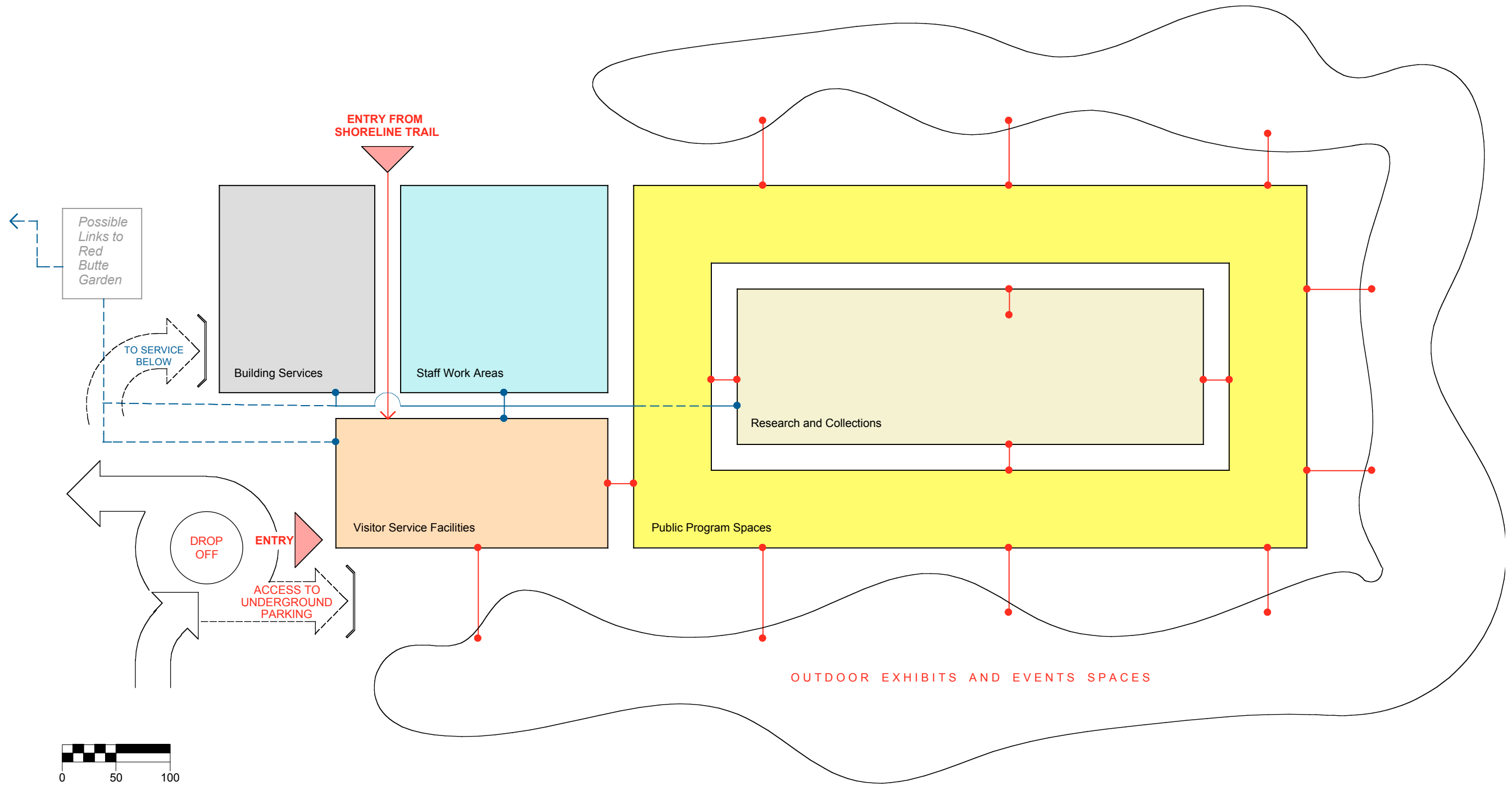
4.2	Exhibits Department		4,790
.1	Technical Shared/Clean Work Space		450
.2	Carpentry		2,270
.1	Carpentry Shop	2,000	
.2	Tool Storage	75	
.3	Hardware Storage	75	
.4	Carpentry Storage	120	
.3	Painting		360
.1	Paint Booth	120	
.2	Paint Booth Exhaust	40	
.3	Paint Storage	50	
.4	Paint Set-up/Supplies	150	
.4	Mounts (Welding and Brazing)		280
.1	Exhibit Mount Workroom	200	
.2	Mount Storage	80	
.5	Staging/Clean Assembly		800
.1	Staging/Clean Assembly Workroom	580	
.2	Staging Supply Storage	100	
.3	Mobile Digital Image Capture Studio Storage	120	
.6	Exhibit Support Storage		400
.7	Staff Restrooms		230
4.3	Shared Areas		2,570
.1	Staff Lounge/Resource Area		400
.1	Seating	300	
.2	Kitchenette	100	
.2	Volunteer Lounge		400
.3	Meeting Rooms		450
.1	Meeting Room for 16	300	
.2	Meeting Room for 8	150	
.4	Copier/Workroom/Mailroom		250
.5	Closets		50
.6	Staff Restrooms		230
.7	Staff Showers		140
.8	Supply Storage		150
.9	Graphic Production/Sign Shop/Education Kit Assembly		500
Subtotal Staff Work Areas Net Areas			19,070

Optional Facilities (not included in subtotal)

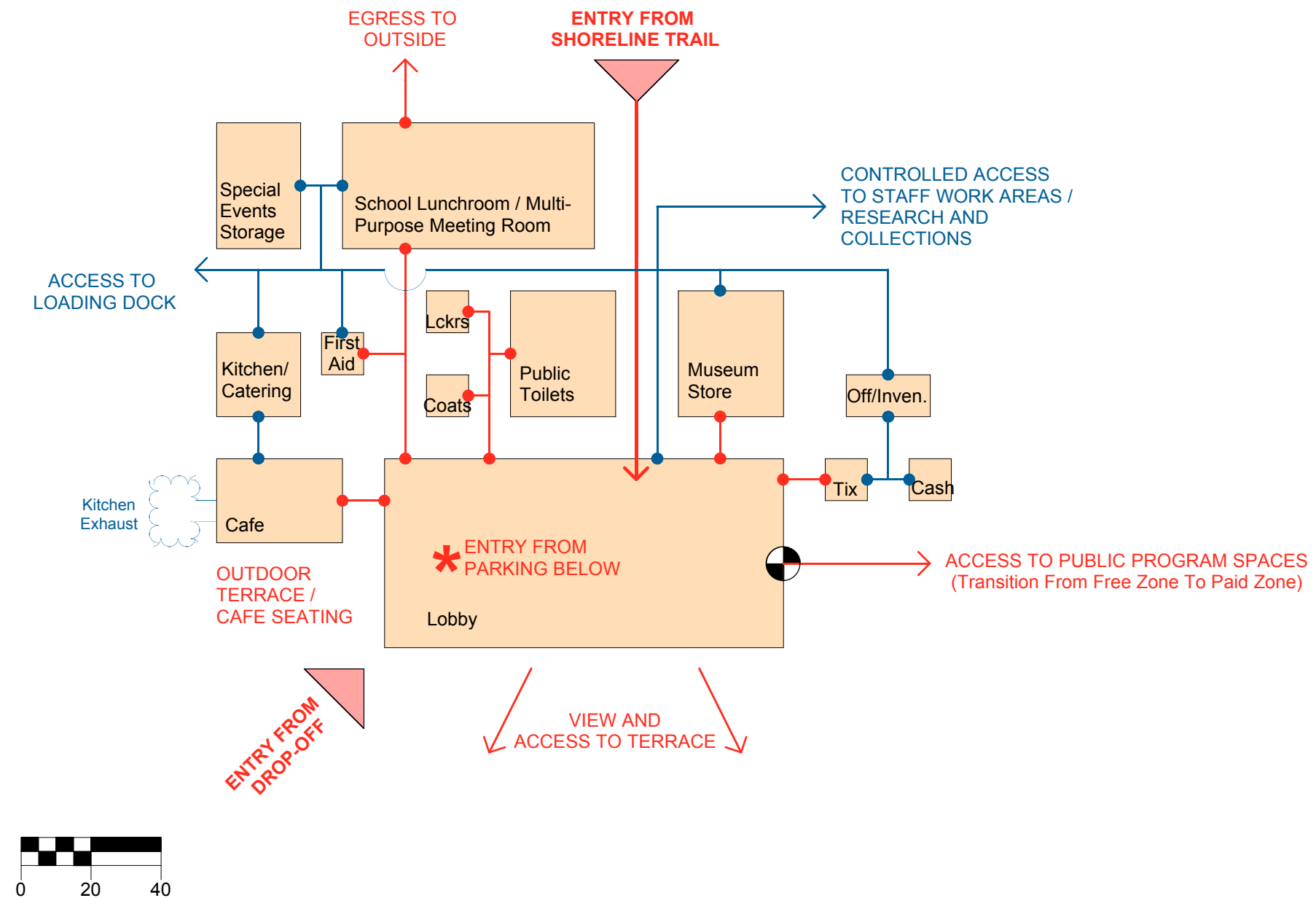
4.4	Genetic Science Learning Center	
.1	Large Office Suite	720
.1	Large Office @ 180 nsf	
.2	Small Office @ 100 nsf	
.3	Shared Work Space for 4 @ 340 nsf (85 sf each)	
.4	Storage @ 100 sf	
.2	Small Office Suite (2 @ 680 nsf)	1,360
.1	Office @ 130 nsf	
.2	Shared Work Space for 6 @ 450 nsf (75 sf each)	
.3	Storage @ 100 nsf	
	GSLC Subtotal	2,080
	Internal Circulation Factor @ +/- 25%	520
	MEP Factor @ +/- 10% of GSLC Subtotal + Line 4.4.3	260
	Net to Gross Factor @ +/- 30% of Line 4.4	860
	Total Gross Area for Genetic Science Learning Center	3,720

Utah Museum of Natural History
Outline Facility Program

5. Building Services		Net Area
5.1 Loading Dock		980
.1 Receiving Area	400	
.2 Trash / Recycling Room	100	
.3 Crating and Uncrating	200	
.4 Fork and Scissor Lift Charging Station	100	
.5 Field Equipment Storage	180	
5.2 Security		300
.1 Main Security Station	150	
.2 Satellite Security Station (See 1.1.2)	--	
.3 Lockers / Toilets	150	
5.3 Maintenance		700
.1 Building Manager Office	100	
.2 Custodial Closets (4 @ 25 nsf)	100	
.3 Supply Storage	150	
.4 Custodial Staff Lockers (2 @ 75 nsf)	150	
.5 Equipment Storage	200	
5.4 External Maintenance		250
.1 Grounds/Outside Exhibits Maintenance Storage		
Mechanical, Electrical, Plumbing, Tele-data Factor (Approximately 10% of subtotal of all other net areas)		11,500
Subtotal Building Services Net Areas		13,730



5.3 Individual Room Data Sheets - Architectural Program



Description

Function: Multi-function gathering space for group orientation, school group mustering, sit-down catering special events, lectures, teaser exhibits, donor recognition, performances, spillover cafe seating expansion. Functions as a public circulation hub and introduction to the Museum.

Capacity: 400 People @ 15sf/person (for banquet seating)

Net Area: 6000 nsf.

Adjacency/Access

Adjacent to: Main Entry, Tickets, Lockers, Coats, Special Events, Storage, Museum Store, Cafe, Free Zone, Public Toilets, Orientation Theater, School Lunchroom, Terrace.

Access to: Administration, Offices, outdoor events areas.

Design Criteria

Architectural

Character: Open, maximize view potential, first impression identity, and personality of the institution, unique, light filled, image of Utah. A hallmark space.

Openings: Large areas of glass for views. Main entry doors. Entry from parking. Potential entry from Shoreline Trail. Doors to terrace.

Ceiling Height/Materials: Minimum double story space / Painted surfaces with acoustically absorptive materials where possible.

Walls: Durable and elegant. Stone (preferably local), architectural woodwork, architectural metals.

Floors: High traffic/hard surface flooring.

Other: Coordinate surfaces and systems with exhibit components. Donor recognition wall (may be located at Collection Care) that is expandable and changeable. Use acoustic material where possible.

Systems

Structural: Building Standard (See Structural Section 4.3.2). 150 psf live load. Long span. Forklift loads. Rhythmic live loads (dancing). Twenty hanger points for ceiling-mounted exhibit materials (1000 lbs each).

Mechanical: Environment A.2, to be verified with final exhibit design (see Mechanical Section 4.3.3).

Lighting: Controllable natural light. Track lighting. Ambient dimmable. Theatrical lighting. Spot lighting for speaker. Cleaning lights. Fixtures shall be located for ease for relamping.

Power: 120 V @ walls and ceilings, 208 V flush floor outlets (provide 2) @ floors.

Plumbing: Drinking fountains.

Security: Coordinate with Main Security Station system.

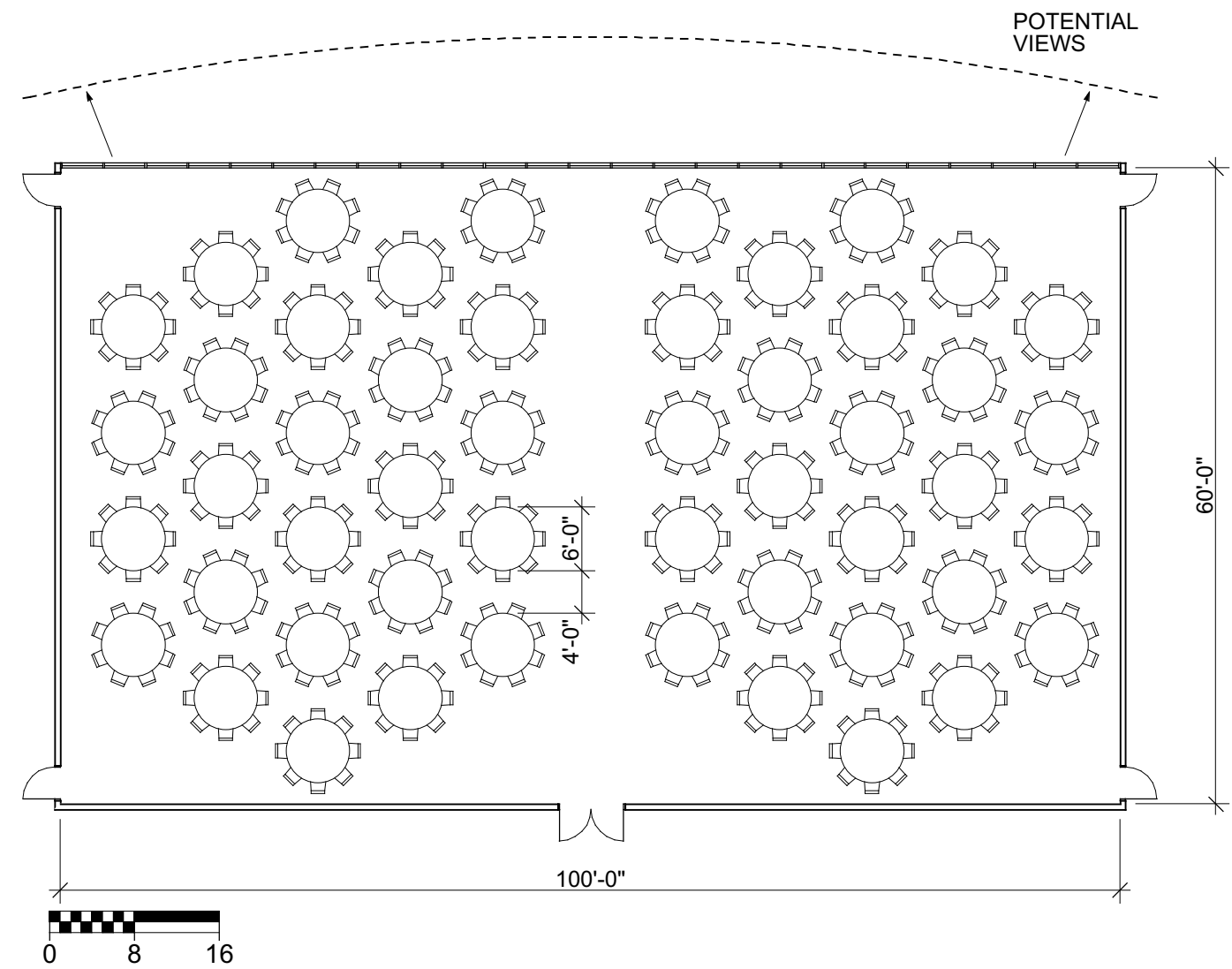
Phone/Data: Public address system, connections for microphone and speakers.

Other: Electronic information/orientation space.

Furnishings and Equipment: Scissor lift (for access to ceilings, high walls), floor polisher, speaker's podium, tickets system (by Museum), video display system Electronic or other information booths may be required. Benches for visitor seating to prepare to arrive or leave.

Notes: Thoughtful, centralized placement of the Lobby and consideration of duty cycles may allow Lobby space to be utilized as auditorium foyer, ticket queuing, special events service areas (bar or buffet), etc., in order to economize space. Provide bench seating for visitors preparing to arrive or depart.

Prototype Plan:



Notes: The diagram above is highly abstracted and should not be literally accepted as representing a recommended plan shape or recommended proportions. Design of the space must be carefully coordinated with the final exhibit design and surrounding spaces. Layout shown demonstrates banquet seating capacity only.

Description

Function: Visitor ticketing, information, lobby security station, group check-in, membership check-in and sales.

Capacity: 4 Stations @ 5 sf (does not include queuing area) plus one station (security) @ 5 sf.

Net Area: 100 nsf.

Adjacency/Access

Adjacent to: Lobby, Lockers, Coats, Office/Store Inventory, Special Events Storage, Cash Room, Museum Store, Ticket Queue.

Access to: Main Security Station, Administrative Offices.

Design Criteria**Architectural**

Character: Friendly, efficient, accessible, consistent with lobby.

Openings: Open to Lobby, secure door to Cash Room.

Ceiling Height/Materials: 12' minimum height / Painted surfaces with acoustically absorptive materials where possible.

Walls: Durable and elegant. Stone (preferably local), architectural woodwork, architectural metals.

Floors: Carpet behind counter.

Other: Electronic menu board for text and images, wheelchair accessible transaction surface for at least one station. Electronic kiosk may be needed.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment A.2, to be verified with final exhibit design (see Mechanical Section 4.3.3).

Lighting: Suitable for transactions and computer station uses. Controllable natural light. Track lighting.

Power: Code standard with supplement for ticketing system.

Plumbing: N/A.

Security: Coordinated with Main Security Station systems (including CCTV).

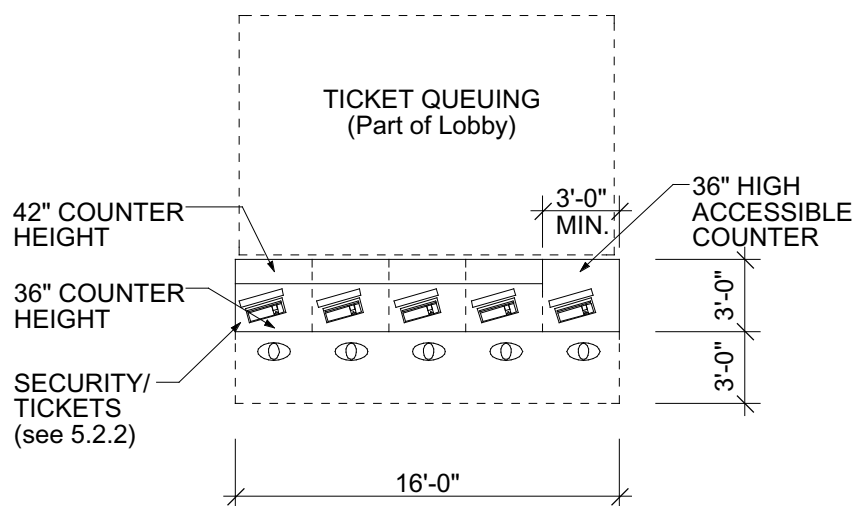
Phone/Data: Outlets at each workstation, clean power.

Other: Illuminated electronic menu board (overhead) networked with Ticketing Stations for schedule, ticket pricing, discounts, announcements, etc. May be electronic or other.

Furnishings and Equipment: Cabinetry to accommodate the networked ticketing, ticket printing, cash take, and security functions. Typical elements include: computer screen, keyboard, cash drawer, below-counter printer and small supply storage. May include point of purchase flyers and brochures in adjacent area.

Notes: Ideally, security station electronics would allow flexibility to switch over to full ticketing station during peak ticket times. Ticketing should be able to be closed off with a finished surface for special events that are held in the lobby.

Prototype Plan:



Notes:

Description

Function: Lockers for visitors to store coats and parcels during their visit. Pay phones for public use.

Capacity: 30 lockers, 2 pay phones.

Net Area: 70 nsf.

Adjacency/Access

Adjacent to: Lobby, Tickets / Cashier, Coats.

Access to: Free zone, public toilets.

Design Criteria

Architectural

Character: Simple, elegant, efficient.

Openings: Open to Free Zone corridor.

Ceiling Height/Materials: 9' soffit / Gypsum board soffits with acoustically absorptive materials.

Walls: Durable and elegant. Stone (preferably local), architectural woodwork, architectural metals.

Gypsum board behind lockers.

Floors: High traffic/hard surface flooring.

Other: Located in free zone.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D, to be verified with final exhibit design (see Mechanical Section 4.3.3).

Lighting: Recessed downlights or indirect fluorescent.

Power: Code standard.

Plumbing: N/A

Security: Preferably visible from Ticketing.

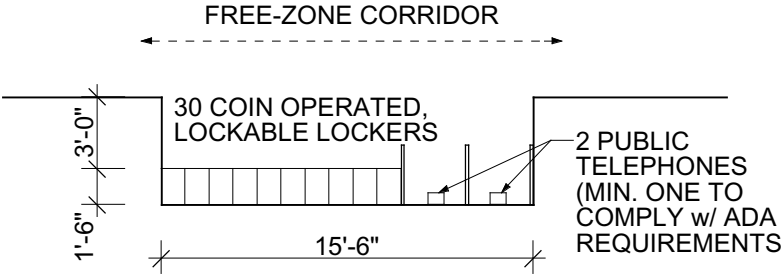
Phone/Data: Telephone connections at each payphone.

Other:

Furnishings and Equipment: 30 stainless steel lockers with coin operated locks (12"w x 18"h x 18"d). Stacked and ganged in rows 3 high.

Notes: Should be visible from ticketing. Should be able to close off or cover with a finished surface for special events in the lobby. Pay phones to meet ADA requirements.

Prototype Plan:



Notes:

1.1.4 Coats / Lost and Found

5.3.1 Visitor Service Facilities

Description

Function: Storage of visitor's coats and lost and found items.

Capacity: 120 coats.

Net Area: 120 nsf.

Adjacency/Access

Adjacent to: Lobby, Tickets / Cashier, Lockers.

Access to: Free zone.

Design Criteria

Architectural

Character: Simple, clean, efficient, secure.

Openings: Single 42" in-swing dutch door with 8" transaction counter on lower leaf, lockable.

Ceiling Height/Materials: 8' minimum height / Accessible acoustical ceiling tile.

Walls: Durable wood and painted gypsum board surfaces.

Floors: Carpet

Other: Located just off lobby.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D, to be verified with final exhibit design (see Mechanical Section 4.3.3).

Lighting: Recessed florescent downlights.

Power: Code standard.

Plumbing: N/A

Security: Visible from Ticketing.

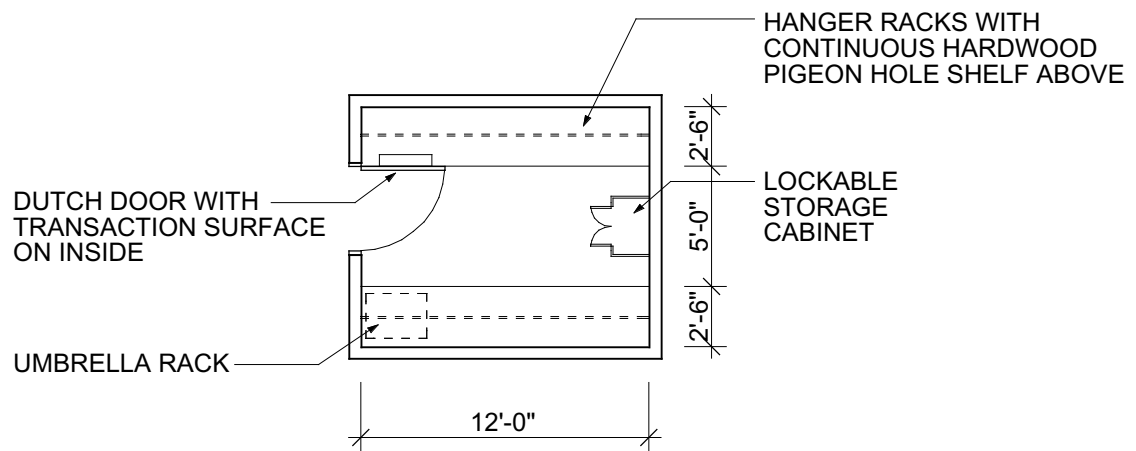
Phone/Data: Telephone and network connections.

Other:

Furnishings and Equipment: 2 built-in hanger rods and parcel shelves, umbrella rack, lockable cabinet for lost items.

Notes: Ceiling of this space can be used as an access point to above ceiling equipment. Interior should be visible from ticketing.

Prototype Plan:



Notes:

1.1.5 Special Events Storage

5.3.1 Visitor Service Facilities

Description

Function: Storage of tables, chairs, and props for special events.

Capacity: 400 Folding or stacking chairs, fifty 8-person round tables plus twelve 8' rectangular tables.

Net Area: 800 nsf.

Adjacency/Access

Adjacent to: Lobby, Tickets / Cashier, Lockers, Coats.

Access to: Public Toilets, Loading Dock, Galleries, Catering Kitchen.

Design Criteria

Architectural

Character: Durable, clean, efficient utility space.

Openings: Double 3' doors.

Ceiling Height/Materials: 12' minimum height / Accessible acoustical ceiling tile.

Walls: Durable painted surfaces.

Floors: Resilient flooring.

Other: Wall bumpers or carpeting as required to protect from rolling carts.

Systems

Structural: Building standard (see Structural Section 4.3.2).

Mechanical: Environment D, to be verified with final exhibit design (see Mechanical Sections 4.3.3).

Lighting: Recessed fluorescent downlights.

Power: Code standard.

Plumbing: N/A

Security: University Standard

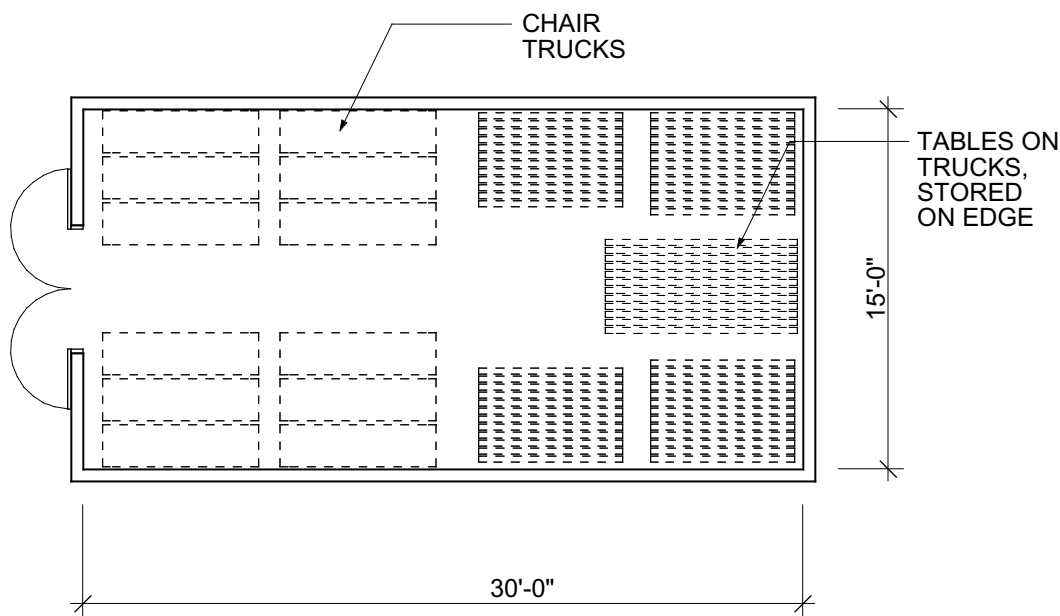
Phone/Data: N/A

Other:

Furnishings and Equipment: Storage racks, dollies, and rolling carts for tables and chairs.

Notes:

Prototype Plan:



Notes: All rooms and fixtures / furniture ADA accessible.

Description

Function: Quiet room with small bathroom, resting area, and staff work area to administer first aid and serve visitors who are ill or injured.

Capacity: --

Net Area: 100 nsf.

Adjacency/Access

Adjacent to: Food Service.

Access to: Main Entry, Lobby, Tickets / Cashier, Lockers, Coats.

Design Criteria

Architectural

Character: Simple, clean, efficient.

Openings: Two single 3' doors.

Ceiling Height/Materials: 8' minimum height / Accessible acoustical ceiling tile.

Walls: Ceramic tile walls at toilet, painted gypsum board.

Floors: Ceramic tile.

Other: Built-in solid surface counter.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D with direct exhaust (see Mechanical Section 4.3.3).

Lighting: Recessed fluorescent downlights.

Power: Code standard.

Plumbing: Toilet and sink.

Security: University standard.

Phone/Data: Telephone and network connections, wireless network internet.

Other:

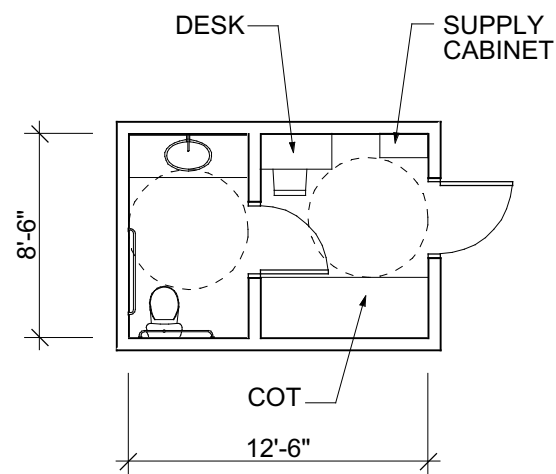
Furnishings and Equipment: 30" x 84" cot, supply cabinet, comfortable chair for nursing.

Notes: This toilet should be available primarily for staff use. Caterers should have access without going through lobby. Staff may take visitors there who need first aid or need to lie down.

5.3.1 Visitor Service Facilities

1.1.6 First Aid / Unisex Toilet

Prototype Plan:



Notes:

1.2.1 Museum Store

5.3.1 Visitor Service Facilities

Description

Function: Retail sales of items relating to the Museum's mission.

Capacity: --

Net Area: 1000 nsf.

Adjacency/Access

Adjacent to: Store Inventory, Cash Room, Store Office, Lobby, Main Entry/Exit.

Access to: Loading Dock, Freight Elevator.

Design Criteria

Architectural

Character: Well organized, attractive, quirky, full of personality.

Openings: Optimize views into Store through glass walls. Security closure at entry. 8' minimum entry width.

Ceiling Height/Materials: 12' minimum height / Acoustic ceiling tiles (possibly exposed ceiling for track lighting).

Walls: Wood, stone, architectural metal, glass, compatible with Lobby.

Floors: Carpet.

Other: Moveable wall panels for closure from lobby during special events.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Indirect fluorescent ambient. Track lighting (120 v. and low voltage for accent/retail lighting).

Fiber optic in cases. Power for moveable wall system.

Power: 120 v. convenience outlets at floors, walls, and special display cases.

Plumbing: N/A

Security: Medium Security (see Electrical Section 4.3.6).

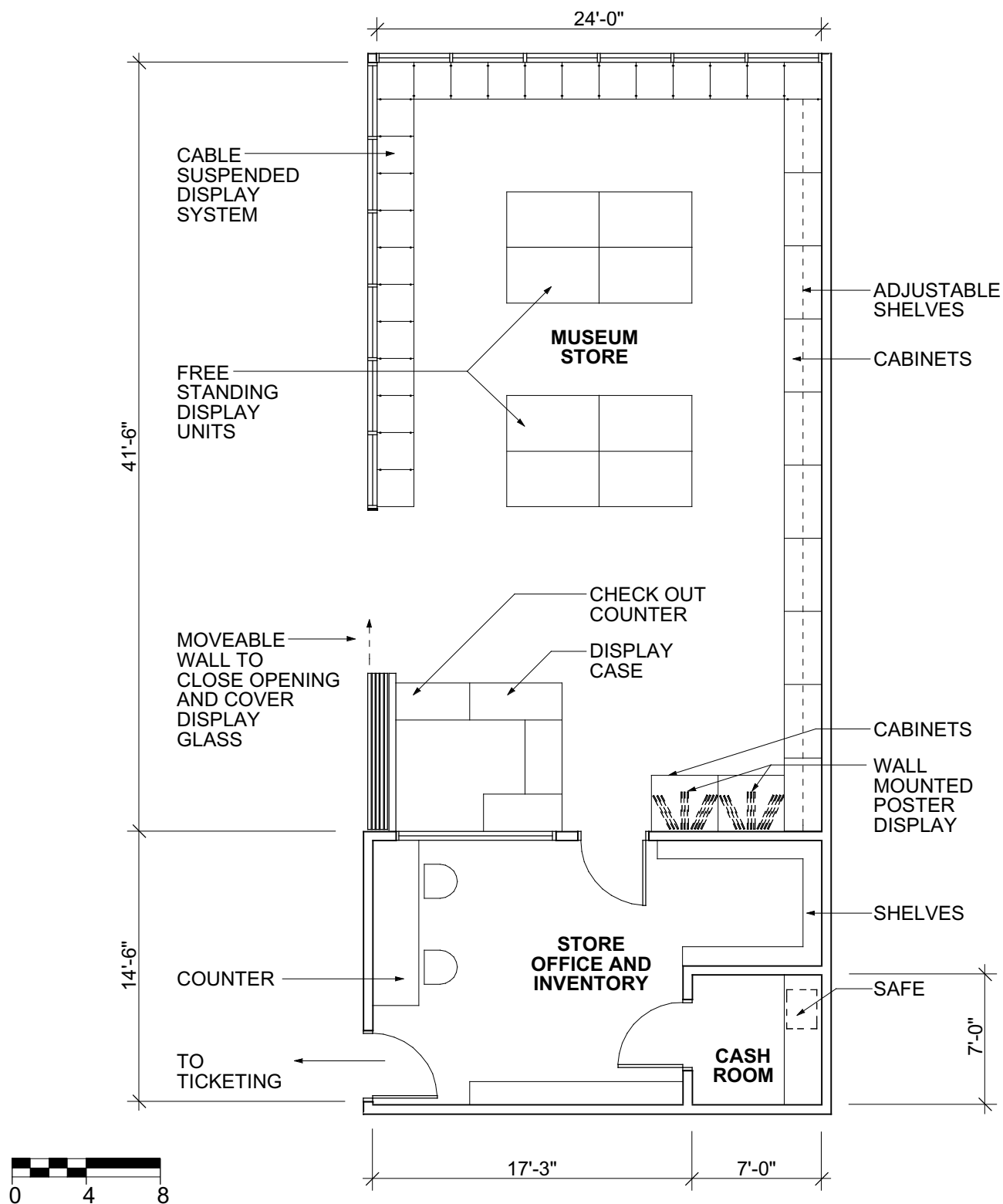
Phone/Data: Telephone and network connections.

Other:

Furnishings and Equipment: As determined by final store display. Store fixtures should accommodate the following product lines: Children's Books, Adult Books, Trading Post (American Indian Crafts), Rocks and Minerals, Dinosaurs, General Science/Nature, and Logowear.

Notes: Museum staff has expressed an interest in exploring the possibility of including a fireplace in the book sales area. Opportunity to tie store design to content of exhibit areas, including space for some interpretive elements in the store itself, e.g. - a paleontology fossil wall, native plants garden, etc.

Prototype Plan:



Notes: The diagram above is highly abstracted and should not be literally accepted as representing a recommended plan shape or recommended proportions. Design of the space must be carefully coordinated with the final exhibit design and surrounding spaces.

1.2.2 Store Office and Inventory

5.3.1 Visitor Service Facilities

Description

Function: Store Inventory, storage of visitor services supplies, office for store and visitors service manager.

Capacity: 2 people.

Net Area: 300 nsf.

Adjacency/Access

Adjacent to: Museum Store, Cash Room, Ticketing.

Access to: Loading Dock, Freight Elevator.

Design Criteria

Architectural

Character: Simple, clean, efficient, secure.

Openings: Two 3' access doors.

Ceiling Height/Materials: 12' minimum height / Accessible ceiling in office, open ceiling in storage.

Walls: Durable wood and painted gypsum board surfaces.

Floors: Carpet in office, seamless resilient flooring in storage.

Other:

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Recessed fluorescent downlights.

Power: Code Standard.

Plumbing: N/A

Security: Medium Security (see Electrical Section 4.3.6).

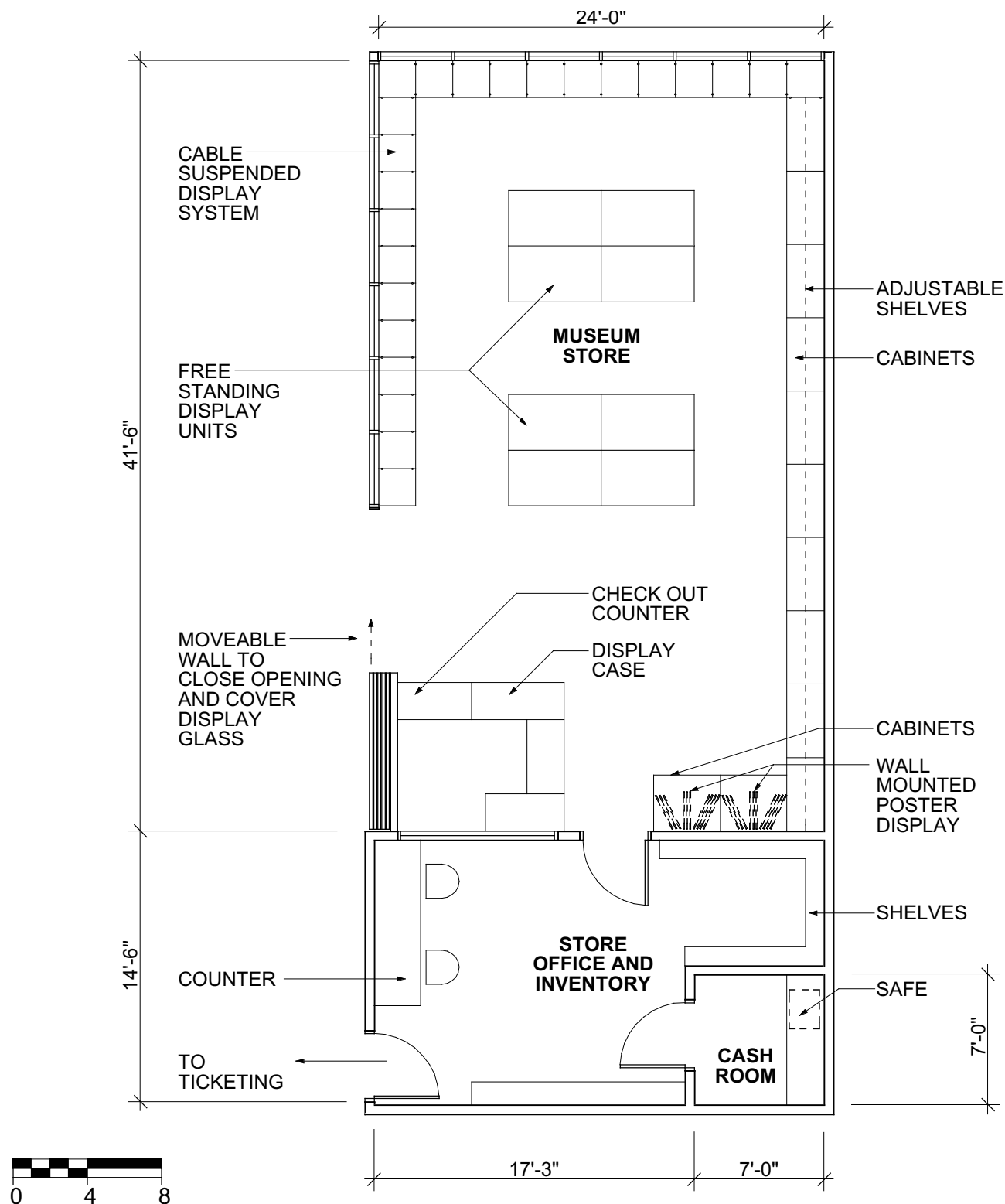
Phone/Data: Telephone and network connections.

Other:

Furnishings and Equipment: Wood shelving units. Desktop computer and monitor. Metal file cabinets.

Notes:

Prototype Plan:



Notes: The diagram above is highly abstracted and should not be literally accepted as representing a recommended plan shape or recommended proportions. Design of the space must be carefully coordinated with the final exhibit design and surrounding spaces.

1.2.3 Cash Room

Description

Function: Cash Room.

Capacity: --

Net Area: 50 nsf.

Adjacency/Access

Adjacent to: Store Office and Inventory Storage.

Access to: Museum Store and Ticketing.

Design Criteria

Architectural

Character: Simple, clean, efficient, secure.

Openings: One 3' lockable metal door.

Ceiling Height/Materials: 8' minimum height / Gypsum board ceiling.

Walls: Durable wood and painted gypsum board over cmu.

Floors: Resilient flooring.

Other: Built-in counter.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Surface mounted fluorescent downlighting.

Power: Code standard.

Plumbing: N/A

Security: High security (see Electrical Section 4.3.6).

Phone/Data: Telephone and network connections.

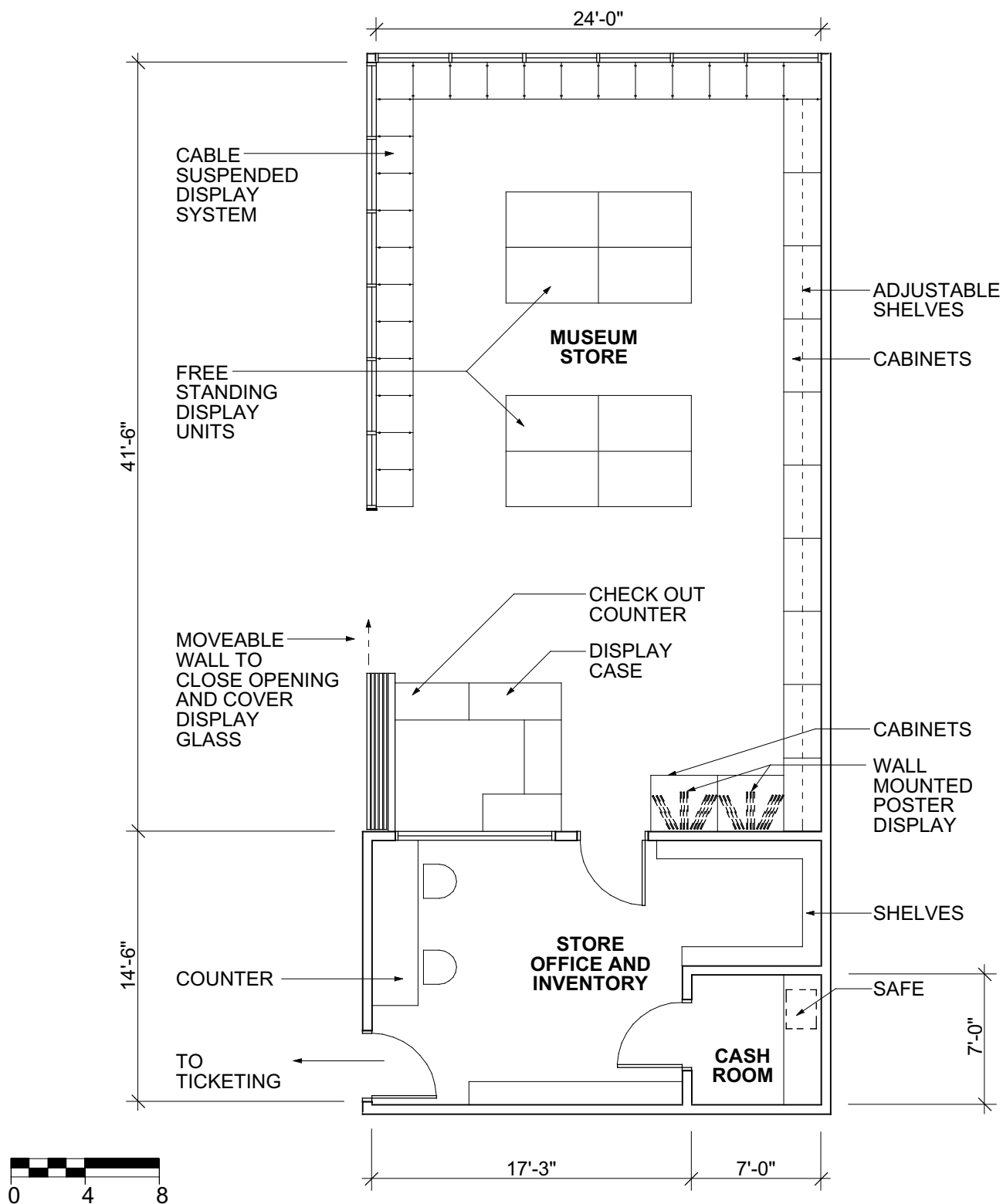
Other:

Furnishings and Equipment: Floor safe.

Notes: Structure ceiling to prevent forced access from adjacent spaces. Ticketing shares the use of this room.

5.3.1 Visitor Service Facilities

Prototype Plan:



Notes: The diagram above is highly abstracted and should not be literally accepted as representing a recommended plan shape or recommended proportions. Design of the space must be carefully coordinated with the final exhibit design and surrounding spaces.

1.3.1 Café Seating

5.3.1 Visitor Service Facilities

Description

Function: Food service area for individual visitors or visitors in small groups.

Capacity: 40 people.

Net Area: 900 nsf.

Adjacency/Access

Adjacent to: Lobby, Outdoor Terrace, Cafe Kitchen.

Access to: Main Entry, Parking, Shoreline Trail.

Design Criteria

Architectural

Character: Social, welcoming, lively, bright, relaxing at the edge of the excitement.

Openings: **Great views.** Open to Lobby (moveable panels to close opening). Doors to terrace.

Ceiling Height/Materials: 12' minimum height / Painted surfaces and acoustically absorptive materials where possible.

Walls: Wood, stone, glass, architectural metal. Compatible with Lobby.

Floors: High traffic/hard surface flooring.

Other: Stainless steel serving counter (verify with final subcontractor).

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Sparkling, warm, incandescent, natural light.

Power: 120 v. convenience outlets.

Plumbing: Filtered water.

Security: University standard.

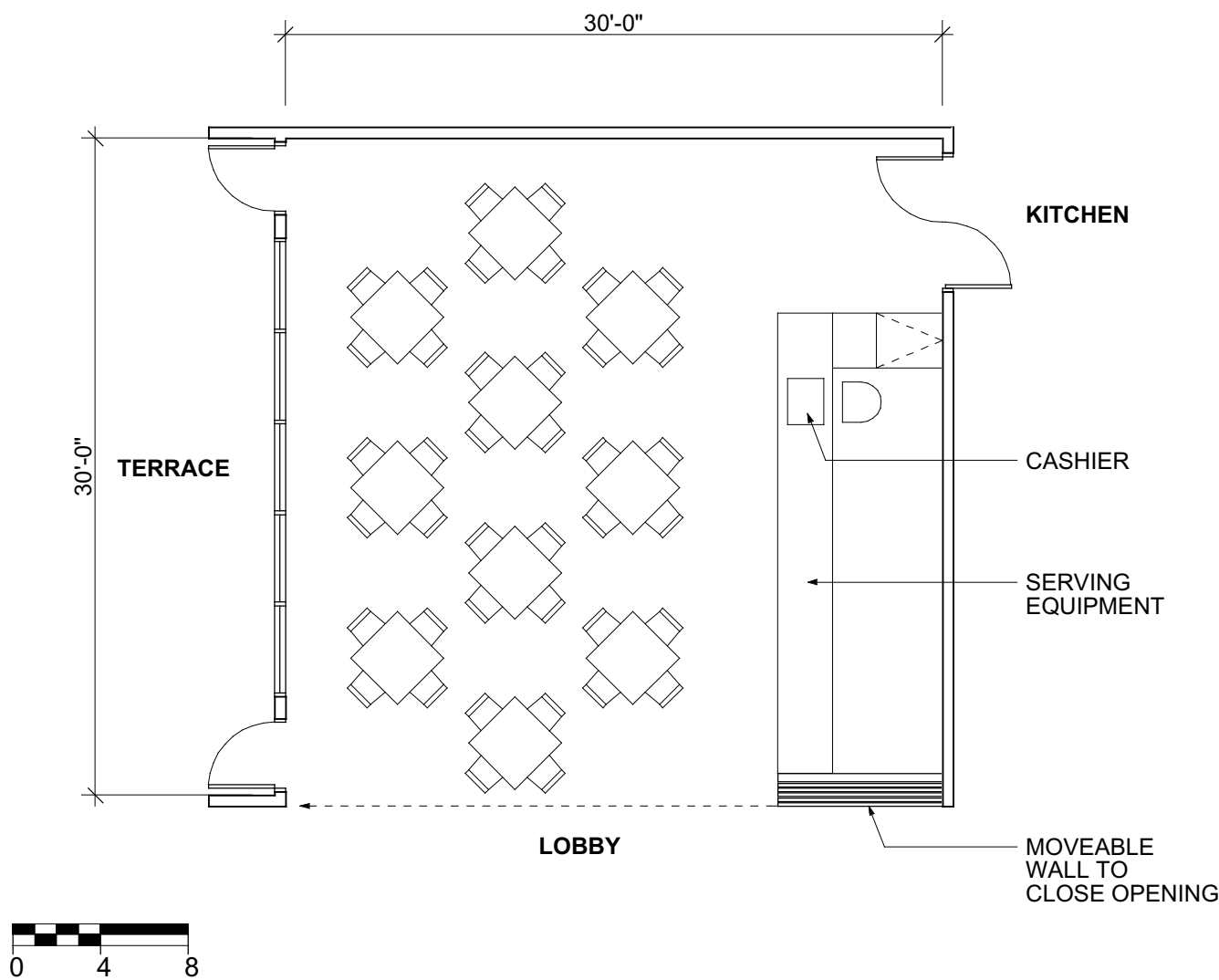
Phones/Data: Six telephone and network connections serving cafe tables (or wireless network access), network to cashiers station.

Other:

Furnishings and Equipment: Cafe tables and chairs for 40. Architectural trash receptacles. Serving equipment, cash register, and check-out counter (including refrigerated and possibly heated). Actual furnishings will depend on subcontracting arrangement and the selected service provider.

Notes: Cafe seating can spill out into lobby and/or terrace at busy times.

Prototype Plan:



Notes:

1.3.2 Café Kitchen / Catering

5.3.1 Visitor Service Facilities

Description

Function: Kitchen serving the cafe and catered functions at the Museum.

Capacity: --

Net Area: 500 nsf.

Adjacency/Access

Adjacent to: Cafe seating, Lobby, School Lunchroom / Multipurpose Room.

Access to: Loading Dock, Freight Elevator, Public Program Areas, Director's Conference, Board Room.

Design Criteria

Architectural

Character: Modern, clean, efficient.

Openings: Double 3' doors (minimum) to Cafe Seating area; Double 3' doors to Service Entrance.

Ceiling Height/Materials: 10' minimum height / Restaurant grade acoustic ceiling.

Walls: Durable, sanitary surfaces. Stainless steel wainscoting/backsplashes.

Floors: Seamless resilient flooring.

Other: See note regarding final fit out.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment E (see Mechanical Section 4.3.3); All systems to be on a separate meter.

Lighting: Indirect fluorescent.

Power: Convenience outlets, outlets above counter, and power for the equipment listed below (to be coordinated with final equipment and subcontractor). All power to be on a separate meter.

Plumbing: Grease traps and plumbing for the equipment listed below (to be coordinated with final equipment and subcontractor).

Security: University standard.

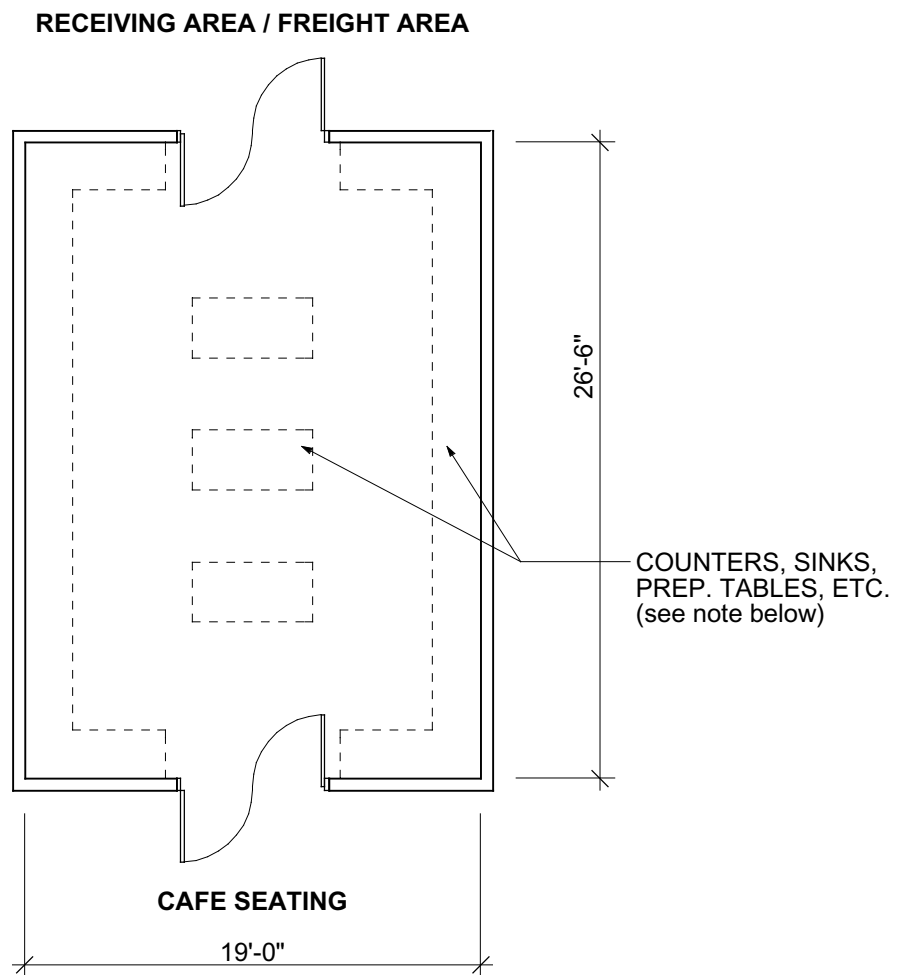
Phone/Data: Telephone and network connections.

Other: Possible gas powered range and oven (to be coordinated with final equipment and subcontractors).

Furnishings and Equipment: Actual furnishings and equipment will depend on subcontracting arrangement and the selected service provider. The kitchen is to be outfitted (plumbing, electrical, and mechanical) for the following equipment: Three compartment sink for ware washing and food prep, hand washing sink, commercial dishwasher, ice machine, beverage station, several reach-in refrigerators, one freezer, range and oven, two commercial microwave ovens, warming cabinets, and several typical stainless steel prep tables.

Notes: Kitchen may change considerably depending on type of service ultimately selected. Outside contractor will be sought to manage food service. Easy access to outside important for successful special events catering.

Prototype Plan:



Notes: Verify layout and equipment with final subcontractor. Final layout to be based on Museum's final equipment list. Museum is investigating the possibility of shared facilities with Red Butte Garden.

1.3.3 School Lunchroom / Multipurpose Room

5.3.1 Visitor Service Facilities

Description

Function: Multi-purpose room for school group lunches, after hours meeting rentals, special presentations, catering set-up for special events. Divisible into 2 spaces by moveable walls.

Capacity: 200 people.

Net Area: 2500 nsf.

Adjacency/Access

Adjacent to: Cafe Kitchen, Lobby.

Access to: Public Toilets, Loading Dock, Freight Elevator, Custodial Closet, Special Events Storage

Design Criteria

Architectural

Character: Versatile, clean, comfortable, open.

Openings: Views and natural light desired. Two sets of double 3' doors to Free Zone corridor. 3' doors to outside and Service Entrance.

Ceiling Height/Materials: 12' minimum height / Acoustic tile and gypsum board ceiling.

Walls: Wood, painted gypsum board, acoustically absorptive materials where possible.

Floors: Seamless resilient flooring.

Other: Moveable wall systems. Sliding wall panels. Solid surface built-in counters.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Indirect cove fluorescent (dimnable). Dimmable downlights with occupancy sensors. Incandescent accent lighting for artwork.

Power: Convenience outlets, power for moveable wall system.

Plumbing: Sink.

Security: University standard.

Phone/Data: Telephone and network connections.

Other:

Furnishings and Equipment: Folding table benches for 150. Trash receptacles. Rolling bins for coats and school lunches. Storage for 200 chairs, stacked. Counter with sink in closet. Moveable wall between the two doors to the Free Zone.

Notes: Provide storage closets for rolling bins. Surfaces must be easily cleaned after school groups leave.

Prototype Plan:



Notes:

1.4.1 Men's Restrooms

5.3.1 Visitor Service Facilities

Description

Function: Men's restrooms

Capacity: 1 @ 450 nsf, 2 @ 225 nsf

Net Area: 900 nsf.

Adjacency/Access

Adjacent to: Women's Restrooms.

Access to: Custodial closet, Public Programs Spaces, school lunchroom; See "notes" below.

Design Criteria

Architectural

Character: Clean, smooth, durable, efficient.

Openings: Single 3' door with privacy baffle to public circulation.

Ceiling Height/Materials: 8' minimum height / Epoxy painted gypsum boards with dropped soffits over sinks.

Walls: Ceramic tile.

Floors: Ceramic tile.

Other: Stainless steel partitions and accessories. Mirror over sink. Fold-down baby changing station.
Solid surface counter.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D with direct exhaust (see Mechanical Section 4.3.3).

Lighting: Baffled fluorescent over sinks. Recessed downlights elsewhere with occupancy sensors.

Power: Code Standard.

Plumbing: Faucets, urinals, and toilets with sensors. Sinks and floor drain.

Security: University standard.

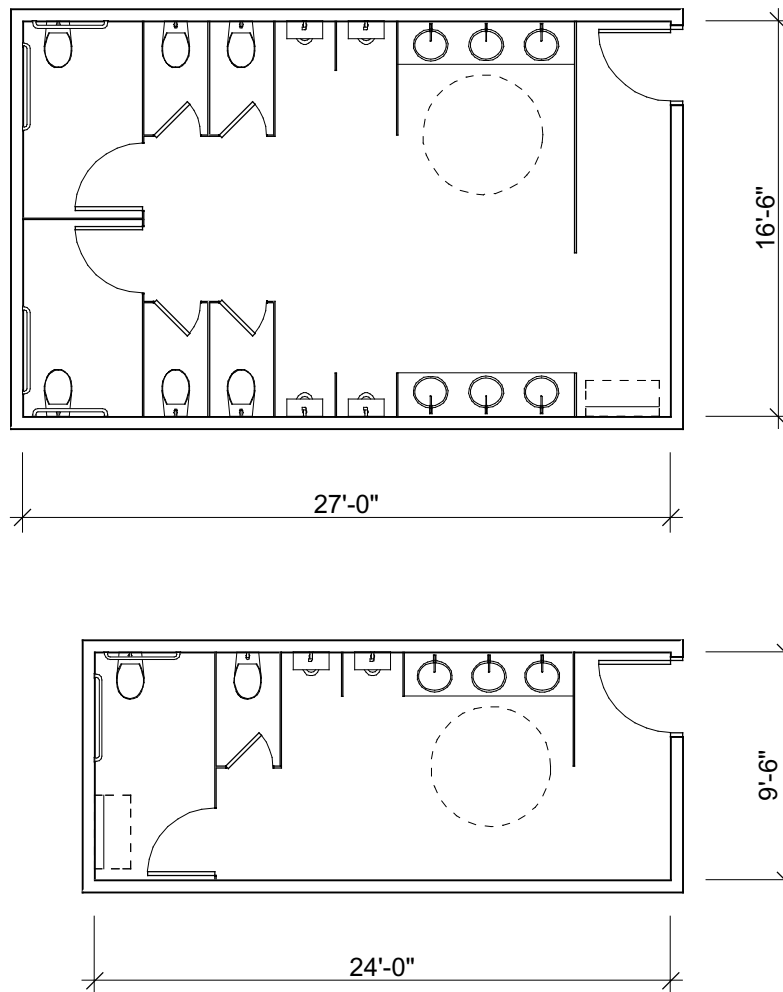
Phone/Data: N/A

Other:

Furnishings and Equipment: Accessories include toilet paper dispensers, in-wall paper towel dispensers with integral trash cans, free standing below counter trash bins. Possibly hand dryers (subject to green review.) Certain restroom furnishings will be supplied by the University.

Notes: Must meet all ADA requirements. Standard university toilet room components may not be appropriate to the quality of the Museum. Review for appropriateness during design phase. One set of bathrooms should be on each floor of public space, as close to classrooms as possible. Largest bathrooms should be off lobby, close to school lunchroom. See Prototype Plan Notes for fixture count assumption.

Prototype Plan:



Notes: Restroom fixture counts are based on the following:

Public Restrooms

Female: 32 water closets / 12 lavatories

Male: 18 water closets / 12 lavatories

Staff Restrooms

Female: 6 water closets / 3 lavatories

Male: 6 water closets / 3 lavatories

These are preliminary counts based on the program square footage. Actual fixture counts must be verified during the design based on the actual size/configuration of the Museum.

1.4.2 Women's Restrooms

5.3.1 Visitor Service Facilities

Description

Function: Women's restrooms

Capacity: 1 @ 600 nsf, 2 @ 350 nsf

Net Area: 1300 nsf.

Adjacency/Access

Adjacent to: Men's Restrooms.

Access to: Custodial closet, Public Program Spaces, school lunchroom; See "note" below.

Design Criteria

Architectural

Character: Clean, smooth, durable, efficient.

Openings: Single 3' door with privacy baffle to public circulation.

Ceiling Height/Materials: 8' minimum height / Epoxy painted gypsum board with dropped soffits over sinks.

Walls: Ceramic tile.

Floors: Ceramic tile.

Other: Stainless steel partitions and accessories. Mirror over sink. Fold-down baby changing station.

Solid surfaces counter.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D with direct exhaust (see Mechanical Section 4.3.3).

Lighting: Baffled fluorescent over sinks. Recessed downlights elsewhere with occupancy sensors.

Power: Code standard.

Plumbing: Faucets and toilets with sensors. Sinks and floor drain.

Security: University standard.

Phone/Data: N/A.

Other:

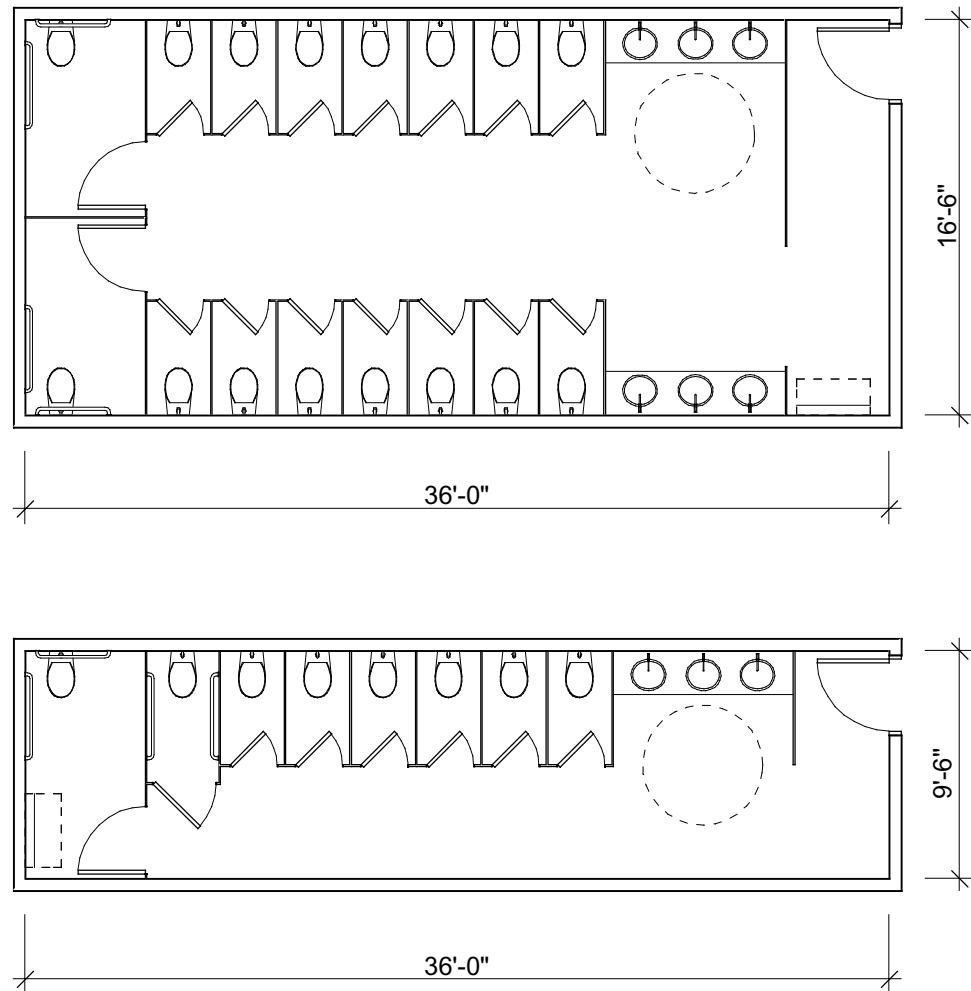
Furnishings and Equipment: Accessories include toilet paper dispensers, sanitary napkin disposal bins, in-wall paper towel dispensers with integral trash cans, free standing below counter trash bins. Possibly hand dryers (subject to green review). Certain restroom furnishing will be supplied by University.

Notes: Must meet all ADA requirements. Standard university toilet room components may not be appropriate to the quality of the Museum. Review for appropriateness during design phase. One set of bathrooms should be on each floor of public space, as close to classrooms as possible. Largest bathrooms should be off lobby, close to school lunchroom. See Prototype Plan Notes for fixture count assumption.

5.3.1 Visitor Service Facilities

1.4.2 Women's Restrooms

Prototype Plan:



Notes: Restroom fixture counts are based on the following:

Public Restrooms

Female: 32 water closets / 12 lavatories

Male: 18 water closets / 12 lavatories

Staff Restrooms

Female: 6 water closets / 3 lavatories

Male: 6 water closets / 3 lavatories

These are preliminary counts based on the program square footage. Actual fixture counts must be verified during the design based on actual size/configuration of the Museum.

1.4.3 Family Toilets

5.3.1 Visitor Service Facilities

Description

Function: Unisex family toilet.

Capacity: 1 family.

Net Area: 100 nsf.

Adjacency/Access

Adjacent to: Men's and Women's Restrooms off Lobby.

Access to: Lobby, Food Service, Museum Store, Ticketing, school lunchroom.

Design Criteria

Architectural

Character: Simple, clean, efficient, secure.

Openings: Single 3' door with privacy lock.

Ceiling Height/Materials: 8' minimum height / Epoxy painted gypsum board with dropped soffits over fixtures.

Walls: Ceramic tile.

Floors: Ceramic tile.

Other: Solid surface counter.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D with direct exhaust (see Mechanical Section 4.3.3).

Lighting: Baffled fluorescent over fixtures. Recessed fluorescent general downlighting with occupancy sensors.

Power: Code standard.

Plumbing: Faucets with sensors. Toilet, sink, and floor drain.

Security: University standard.

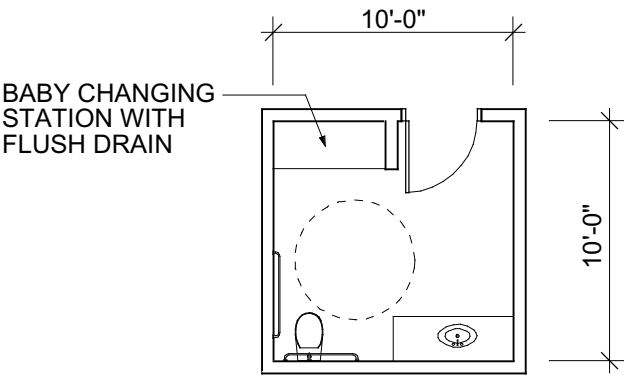
Phone/Data: N/A.

Other:

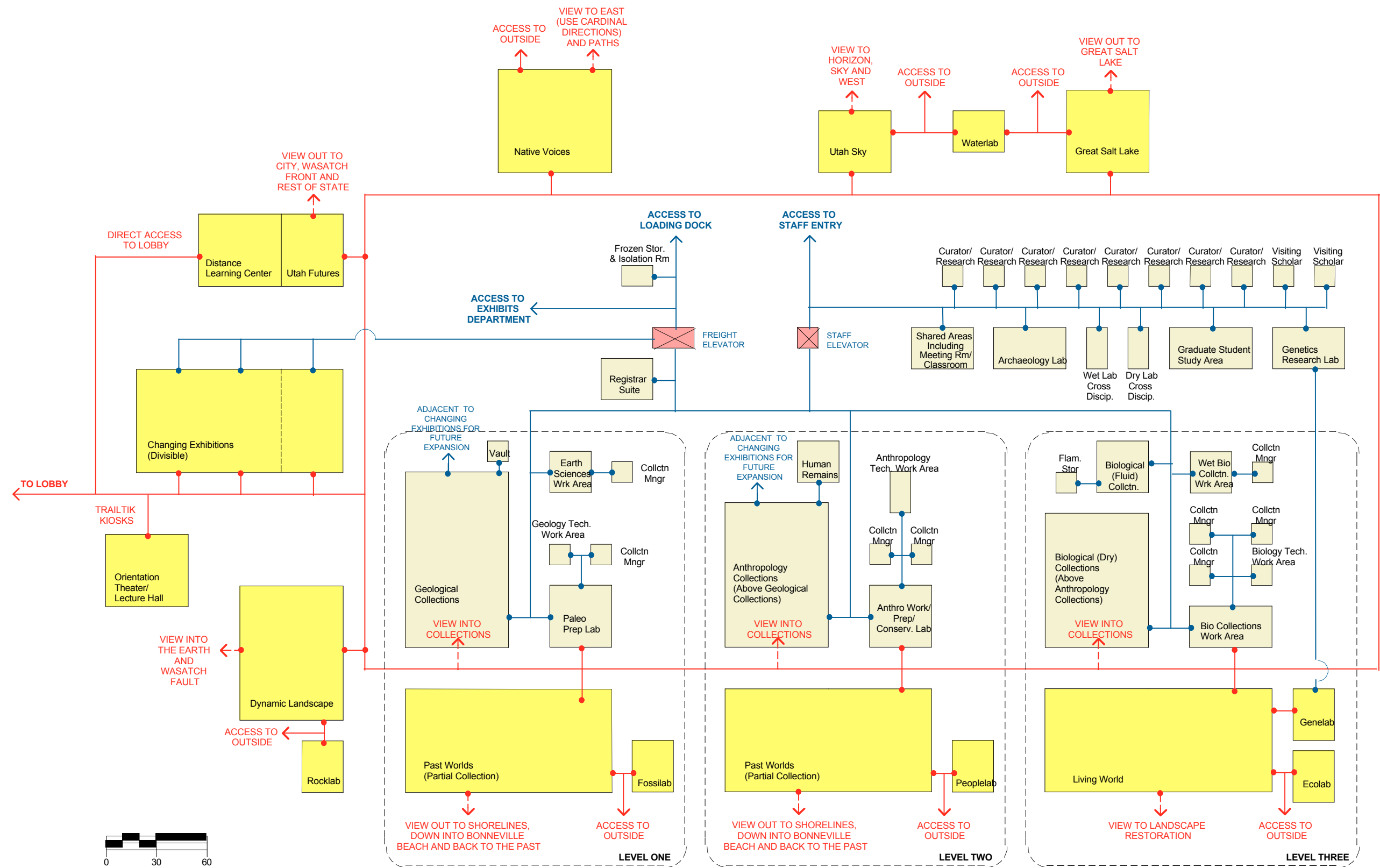
Furnishings and Equipment: Sink, counter, faucets, floor drain, baby changing station. Stainless steel accessories including soap, towel, and toilet paper dispensers, sanitary napkin disposal bin, trash can, mirror, and coat hook.

Notes: ADA accessible room and fixtures. Located off lobby.

Prototype Plan:

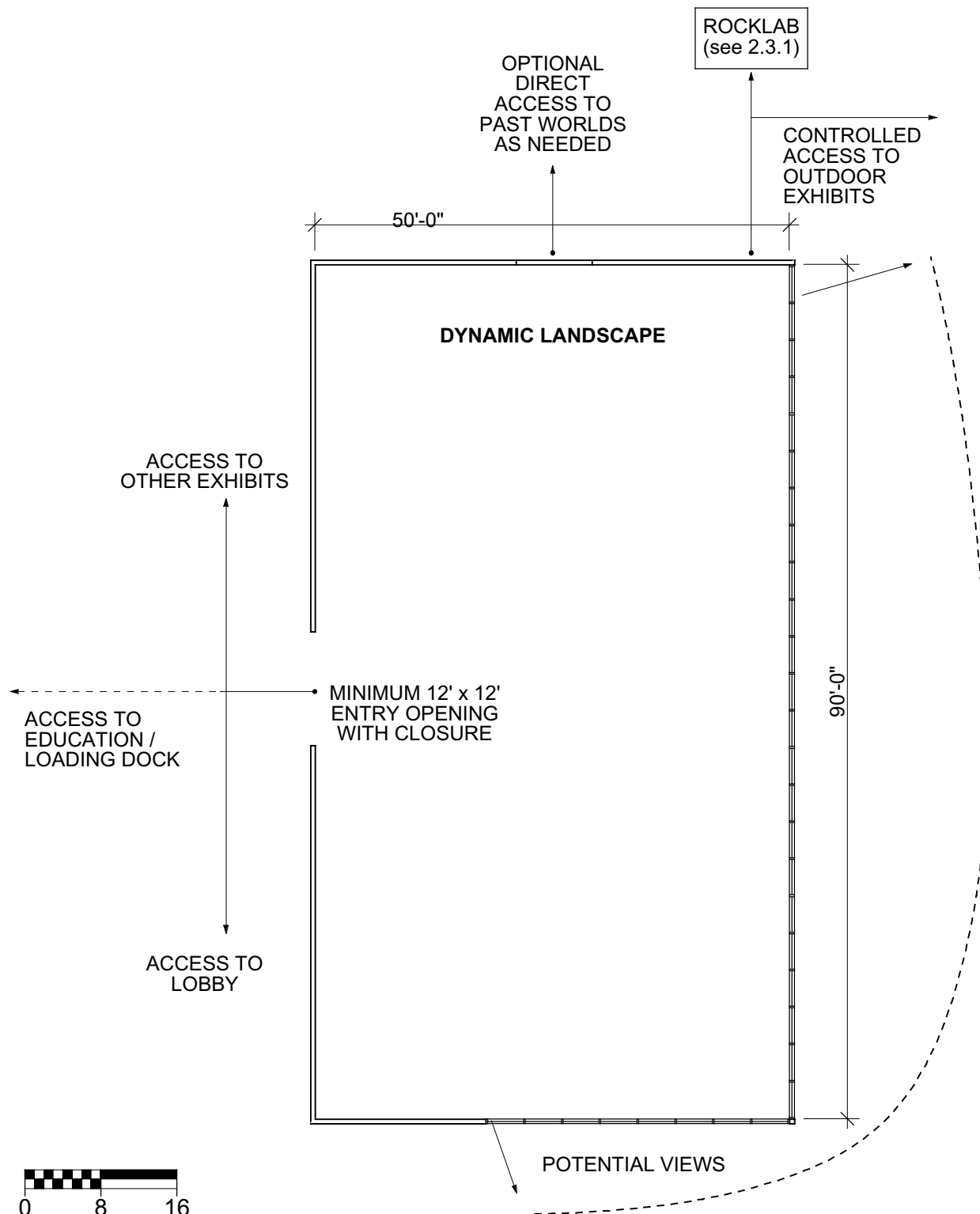


Notes:



Description	
Function:	Public exhibition gallery focusing on Utah’s geography and geology.
Capacity:	---
Net Area:	4500 nsf (including dedicated exhibit support spaces; excluding classrooms, labs, and outdoor areas).
Adjacency/Access	
Adjacent to:	Past Worlds Observatory, Rocklab (embedded), Mineralogy portion of Geological Collections room.
Access to:	Living Worlds Observatory, Loading Dock (or Freight Elevator), Exterior (through intermediate “airlock” space), Education Staff.
Design Criteria	
Architectural	
Character:	Of the earth (refer to Interpretive Plan for additional criteria).
Openings:	View to the earth, Wasatch Fault; minimum 12’ x 12’ entry with closure system as required for security/fire.
Ceiling Height/Materials:	12’ minimum / Painted exposed structure with acoustic baffles.
Walls:	Taped gypsum board over fire-retardant treated plywood.
Floors:	Sealed concrete, level.
Other:	
Systems	
Structural:	Building Standard (see Structural Section 4.3.2). 150 psf live load. Forklift loads. Column free.
Mechanical:	Environment A.2, to be verified with final exhibition design (see Mechanical Section 4.3.3).
Lighting:	Highly flexible track lighting. Housecleaning lights. Controllable natural light.
Power:	120 v. quad convenience outlets 10’ o.c. along wall perimeter. Three-280 v. flush floor outlets. Clean power for A/V.
Plumbing:	As required by exhibits. No overhead pressurized water or waste piping.
Security:	High Security (see Electrical Section 4.3.6).
Data/Phone:	Network connections along walls at 10’ o.c and in floors.
Other:	Pre-action Sprinkler System.
Furnishings and Equipment:	
This space will accommodate custom-designed exhibit components, artifacts, collection items, and may have extensive A/V and IT requirements. Supporting infrastructure must be carefully coordinated during the design phase.	
Notes:	
The architectural character and final materials palette for this space will be largely determined by exhibition elements that have not been designed at the time of preparing this program. For current architectural costing purposes, this spaces is to be considered “shell space.” Access to the outside may be through the embedded classroom.	

Prototype Plan:



Notes: The diagram above is highly abstracted and should not be literally accepted as representing a recommended plan shape or recommended proportions. Design of the space must be carefully coordinated with the final exhibit design and surrounding spaces.

2.1.2 Past Worlds

5.3.2 Public Program Spaces

Description

Function: Public exhibition gallery focusing on paleontology, archaeology, and evolution.

Capacity: --

Net Area: 14,750 nsf (including dedicated exhibit support spaces; excluding outdoor exhibit areas, class rooms, labs), possibly divided into two areas on two different levels.

Adjacency/Access

Adjacent to: Dynamic Landscape Observatory, Living World Observatory, Fossilab (embedded), Peoplelab (embedded), Paleontology portion of Geological Collection room, Archaeology portion of Anthropology Collection, Paleontology Prep Lab, Anthropology Prep Lab.

Access to: Loading Dock (or Freight Elevator), exterior (through intermediate "airlock" space), Education Staff Areas.

Design Criteria

Architectural

Character: Dynamic, active, scientific, accessible, transparent, layered (refer to Interpretive Plan for additional criteria).

Openings: Views into labs, classrooms, collections and outward to shoreline, Bonneville Beach. Minimum 12' x 12' entry with closure system as required for security/fire separation.

Ceiling Height/Materials: 12' minimum / Painted exposed structure with acoustic baffles.

Walls: Taped gypsum board over fire-retardant treated plywood.

Floors: Sealed concrete, level.

Other:

Systems

Structural: Building Standard (see Structural Section 4.3.2). 150 psf live load. Forklift loads. Column free.

Mechanical: Environment A.2, to be verified with final exhibition design (see Mechanical Section 4.3.3).

Lighting: Highly flexible track lighting. Housecleaning lights. Controllable natural light.

Power: 120 v. quad convenience outlets 10' o.c. along wall perimeter. Three-280 v. flush floor outlets.

Clean power for A/V.

Plumbing: As required by exhibits. No overhead pressurized water or waste piping.

Security: High Security (see Electrical Section 4.3.6).

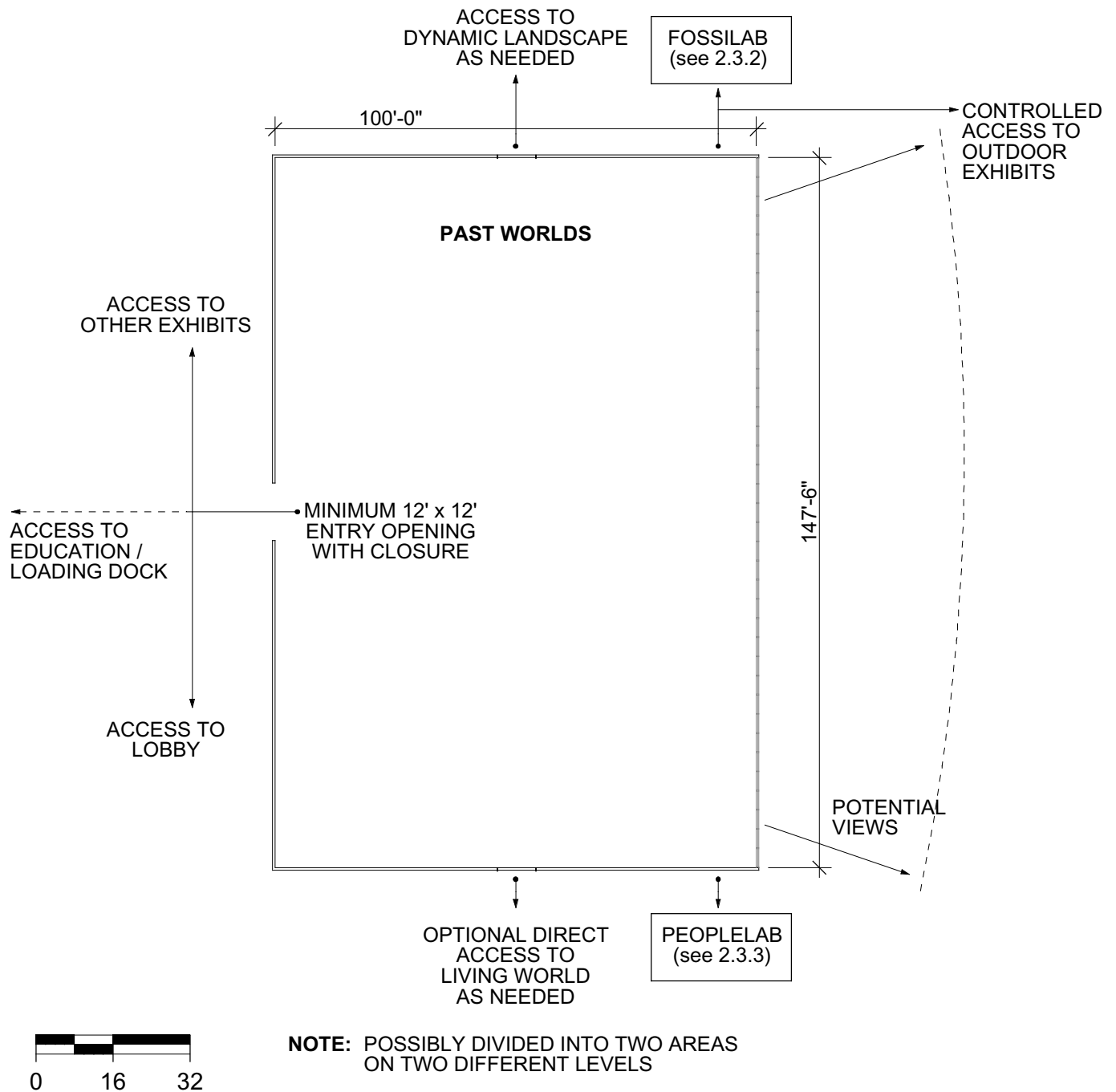
Phone/Data: Network connections along walls at 10' o.c and in floors.

Other: Pre-action Sprinkler System.

Furnishings and Equipment: This space will accommodate custom-designed exhibit components, artifacts, collection items, and may have extensive A/V and IT requirements. Supporting infrastructure must be carefully coordinated during the design phase.

Notes: The architectural character and final materials palette for this space will be largely determined by exhibition elements that have not been designed at the time of preparing this program. For current architectural costing purposes, this space is to be considered "shell space." Access to outside may be through one or both classrooms.

Prototype Plan:



Notes: The diagram above is highly abstracted and should not be literally accepted as representing a recommended plan shape or recommended proportions. Design of the space must be carefully coordinated with the final exhibit design and surrounding spaces.

2.1.3 Living World

5.3.2 Public Program Spaces

Description

Function: Public exhibition gallery focusing on the interconnectedness of life on earth.

Capacity: --

Net Area: 8000 nsf (including dedicated exhibit support spaces; excluding classrooms, labs, and outdoor areas).

Adjacency/Access

Adjacent to: Past Worlds Observatory, Great Salt Lake Observatory, Genelab (embedded), Ecolab (embedded), Bio Collections Work Area, Biology Dry Collections.

Access to: Loading Dock (or Freight Elevator), Exterior (through intermediate "airlock" space), Education Staff Areas.

Design Criteria

Architectural

Character: Lively, beautiful, awe-inspiring, engaging (refer to Interpretive Plan for additional criteria).

Openings: View to restored landscape area. Minimum 12' x 12' entry with closure system as required for security/fire separation.

Ceiling Height/Materials: 12' minimum / Painted exposed structure with acoustic baffles.

Walls: Taped gypsum board over fire-retardant treated plywood.

Floors: Sealed concrete, level.

Other:

Systems

Structural: Building Standard (see Structural Section 4.3.2). 150 psf live load. Forklift loads. Column free.

Mechanical: Environment A.2, to be verified with final exhibition design (see Mechanical Section 4.3.3).

Lighting: Highly flexible track lighting. Housecleaning lights. Controllable natural light.

Power: 120 v. quad convenience outlets 10' o.c. along wall perimeter. Three-280 v. flush floor outlets.

Clean power for A/V.

Plumbing: As required by exhibits. No overhead pressurized water piping or waste piping.

Security: High Security (see Electrical Section 4.3.6).

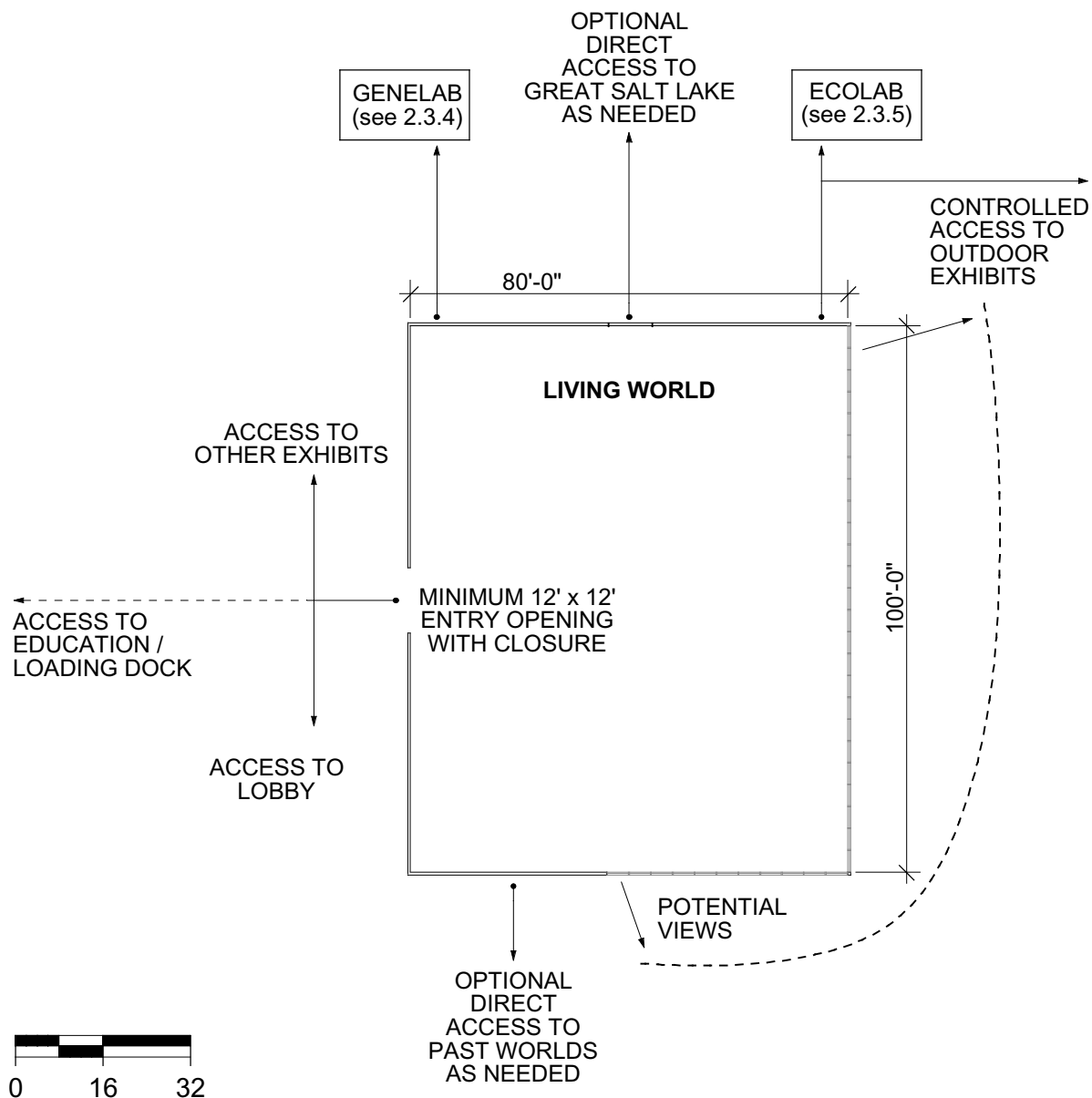
Phone/Data: Network connections along walls at 10' o.c and in floors.

Other: Pre-action Sprinkler System.

Furnishings and Equipment: This space will accommodate custom-designed exhibit components, artifacts, collection items, and may have extensive A/V and IT requirements. Supporting infrastructure must be carefully coordinated during the design phase.

Notes: The architectural character and final materials palette for this space will be largely determined by exhibition elements that have not been designed at the time of preparing this program. For current architectural costing purposes, this space is to be considered "shell space." Access to outside may be through Ecolab. Genelab cannot have access to outdoors.

Prototype Plan:



Notes: The diagram above is highly abstracted and should not be literally accepted as representing a recommended plan shape or recommended proportions. Design of the space must be carefully coordinated with the final exhibit design and surrounding spaces.

2.1.4 Native Voices

5.3.2 Public Program Spaces

Description

Function: Public exhibition gallery and performance area focusing on living native peoples of Utah.

Capacity: --

Net Area: 4000 nsf (including dedicated exhibit and performance support spaces, excluding outdoor exhibit areas, classrooms, labs).

Adjacency/Access

Adjacent to: Utah Futures Observatory, Utah Sky Observatory.

Access to: Past Worlds Observatory, Loading Dock (or Freight Elevator), Exterior (through intermediate “airlock” space), Education Staff Areas, ethnography collection within Anthropology Collection.

Design Criteria

Architectural

Character: Warm, welcoming, noble, colorful, emphasis on creative use of natural materials. Oriented along cardinal directions with view and exit to east. (refer to Interpretive Plan for additional criteria).

Openings: View and access to east. Airlock to exterior. Minimum 12' x 12' entry with closure system as required for security/fire separation.

Ceiling Height/Materials: Tall, gracious, 12' minimum / Painted exposed structure with acoustic baffles.

Walls: Taped gypsum board over fire-retardant treated plywood.

Floors: Sealed concrete, level.

Other:

Systems

Structural: Building Standard (see Structural Section 4.3.2). 150 psf live load. Forklift loads. Column free.

Mechanical: Environment A.2, to be verified with final exhibition design (see Mechanical Section 4.3.3).

Lighting: Highly flexible track lighting. Housecleaning lights. Controllable natural light.

Power: 120 v. quad convenience outlets 10' o.c. along wall perimeter. Three-280 v. flush floor outlets.

Clean power for A/V.

Plumbing: As required by exhibits. No overhead pressurized water or waste piping.

Security: High Security (see Electrical Section 4.3.6).

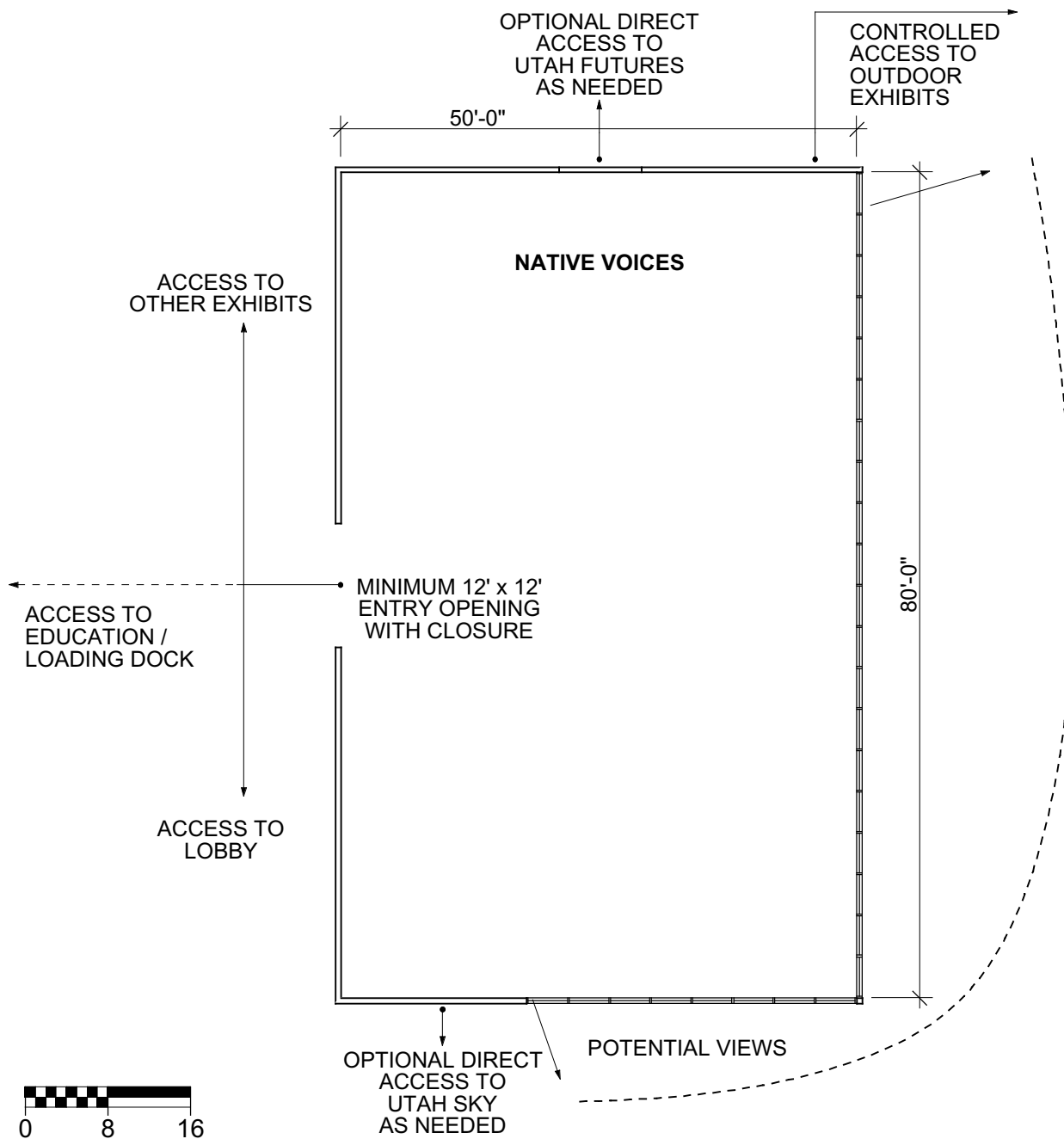
Phone/Data: Network connections along walls at 10' o.c and in floors.

Other: Pre-action Sprinkler System.

Furnishings and Equipment: This space will accommodate custom-designed exhibit components, artifacts, collection items, and may have extensive A/V and IT requirements. Supporting infrastructure must be carefully coordinated during the design phase.

Notes: The architectural character and final materials palette for this space will be largely determined by exhibition elements that have not been designed at the time of preparing this program. For current architectural costing purposes, this space is to be considered “shell space.” Informal performance space should have area for “stage” or demos, plus casual seating for 36 people. Storage will be needed for tables and chairs.

Prototype Plan:



Notes: The diagram above is highly abstracted and should not be literally accepted as representing a recommended plan shape or recommended proportions. Design of the space must be carefully coordinated with the final exhibit design and surrounding spaces.

2.1.5 Utah Sky

5.3.2 Public Program Spaces

Description

Function: Public exhibition gallery focusing on the sky, weather, climate, and the Earth's atmosphere.

Capacity: --

Net Area: 1500 nsf (including dedicated exhibit support spaces; excluding classrooms, labs, and outdoor areas).

Adjacency/Access

Adjacent to: Great Salt Lake Observatory, Native Voices Observatory, Waterlab.

Access to: Loading Dock (or Freight Elevator), exterior roof terrace (through intermediate "airlock" space), Education Staff Areas, Lobby.

Design Criteria

Architectural

Character: Serene, elegant, vivid, omnipotent (refer to Interpretive Plan for additional criteria).

Openings: View to sky toward the city and horizon. Direct access to outside terrace through airlock.

Minimum 12' x 12' entry with closure system as required for security/fire separation.

Ceiling Height/Materials: 12' minimum / Painted exposed structure with acoustic baffles.

Walls: Taped gypsum board over fire-retardant treated plywood.

Floors: Sealed concrete, level.

Other:

Systems

Structural: Building Standard (see Structural Section 4.3.2). 150 psf live load. Forklift loads. Column free.

Mechanical: Environment A.2, to be verified with final exhibition design (see Mechanical Section 4.3.3).

Lighting: Highly flexible track lighting. Housecleaning lights. Controllable natural light. Highly controllable, dimmable lighting system.

Power: 120 v. quad convenience outlets 10' o.c. along wall perimeter floor. Three-280 v. flush floor outlets. Clean power for A/V.

Plumbing: As required by exhibits. No overhead pressurized water or waste piping.

Security: High Security (see Electrical Section 4.3.6).

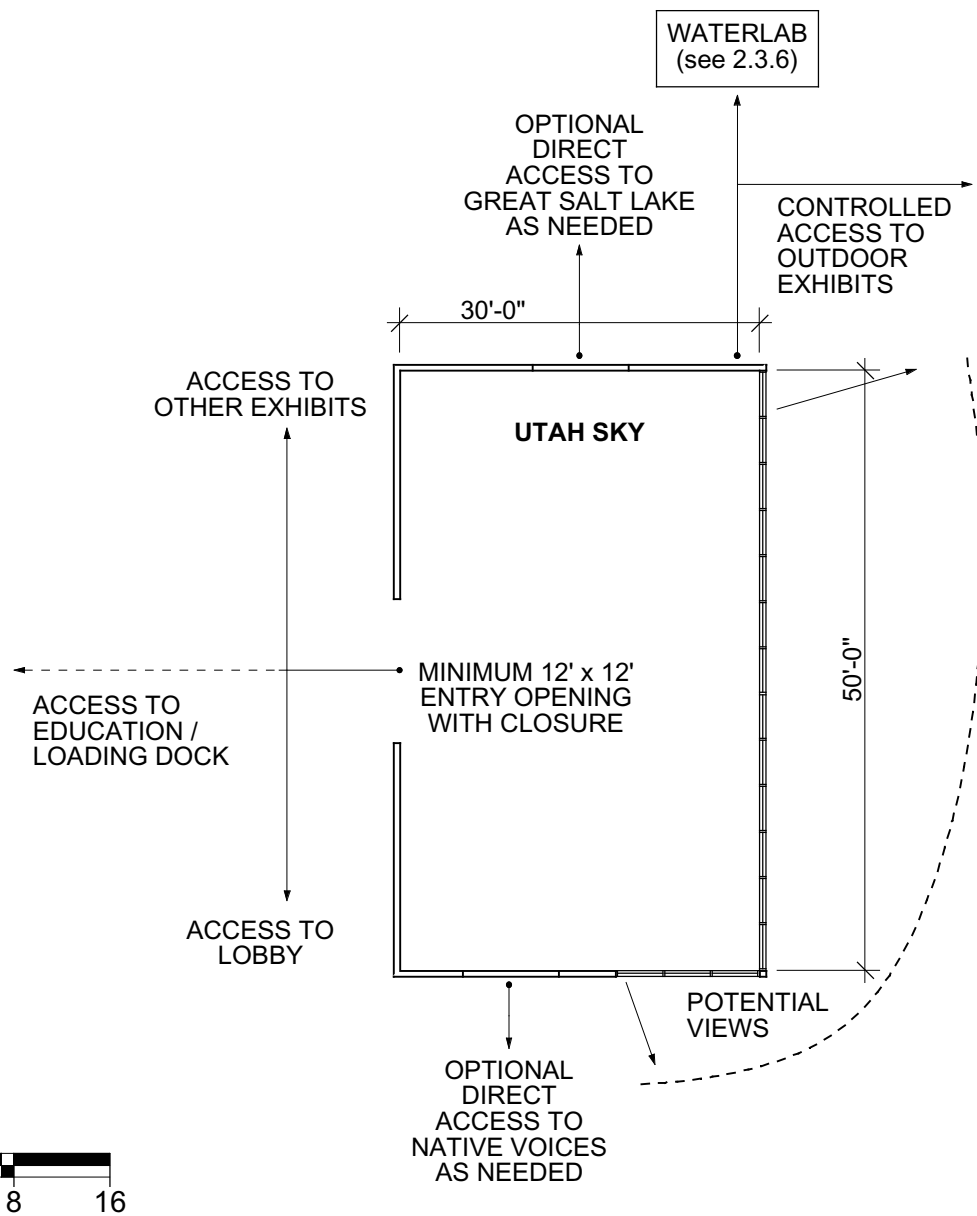
Phone/Data: Network connections along walls at 10' o.c and in floors.

Other: Final exhibit design may include observatory and weatherlab. Pre-action Sprinkler System.

Furnishings and Equipment: This space will accommodate custom-designed exhibit components, artifacts, collection items, and may have extensive A/V and IT requirements. Supporting infrastructure must be carefully coordinated during the design phase.

Notes: The architectural character and final materials palette for this space will be largely determined by exhibition elements that have not been designed at the time of preparing this program. For current architectural costing purposes, this space is to be considered "shell space."

Prototype Plan:



Notes: The diagram above is highly abstracted and should not be literally accepted as representing a recommended plan shape or recommended proportions. Design of the space must be carefully coordinated with the final exhibit design and surrounding spaces.

Description

Function: Public exhibition space focusing on water and the Great Salt Lake.

Capacity: --

Net Area: 2400 nsf (including dedicated exhibit support spaces; excluding classrooms, labs, and outdoor areas).

Adjacency/Access

Adjacent to: Utah Sky Observatory, Waterlab.

Access to: Living World Observatory, Dynamic Landscape Observatory, Loading Dock (or Freight Elevator), exterior roof terrace (shared with Utah Sky Observatory), Education Staff Areas, Lobby.

Design Criteria

Architectural

Character: Lab-like, sleek, contemplative (refer to Interpretive Plan for additional criteria).

Openings: View to Great Salt Lake. Direct access to outside terrace through airlock. Minimum 12' x 12' entry with closure for security/fire separation.

Ceiling Height/Materials: 12' minimum / Painted exposed structure with acoustic baffles.

Walls: Taped gypsum board over fire-retardant treated plywood.

Floors: Sealed concrete, level.

Other:

Systems

Structural: Building Standard (see Structural Section 4.3.2). 150 psf live load. Forklift loads. Column free.

Mechanical: Environment A.2, to be verified with final exhibition design (see Mechanical Section 4.3.3).

Lighting: Highly flexible track lighting. Housecleaning lights. Controllable natural light.

Power: 120 v. quad convenience outlets 10' o.c. along wall perimeter. Three-280 v. flush floor outlets. Clean power for A/V.

Plumbing: As required by exhibits. No overhead pressurized water piping or waste piping. May include watershed, watertable exhibit component.

Security: High Security (see Electrical Section 4.3.6).

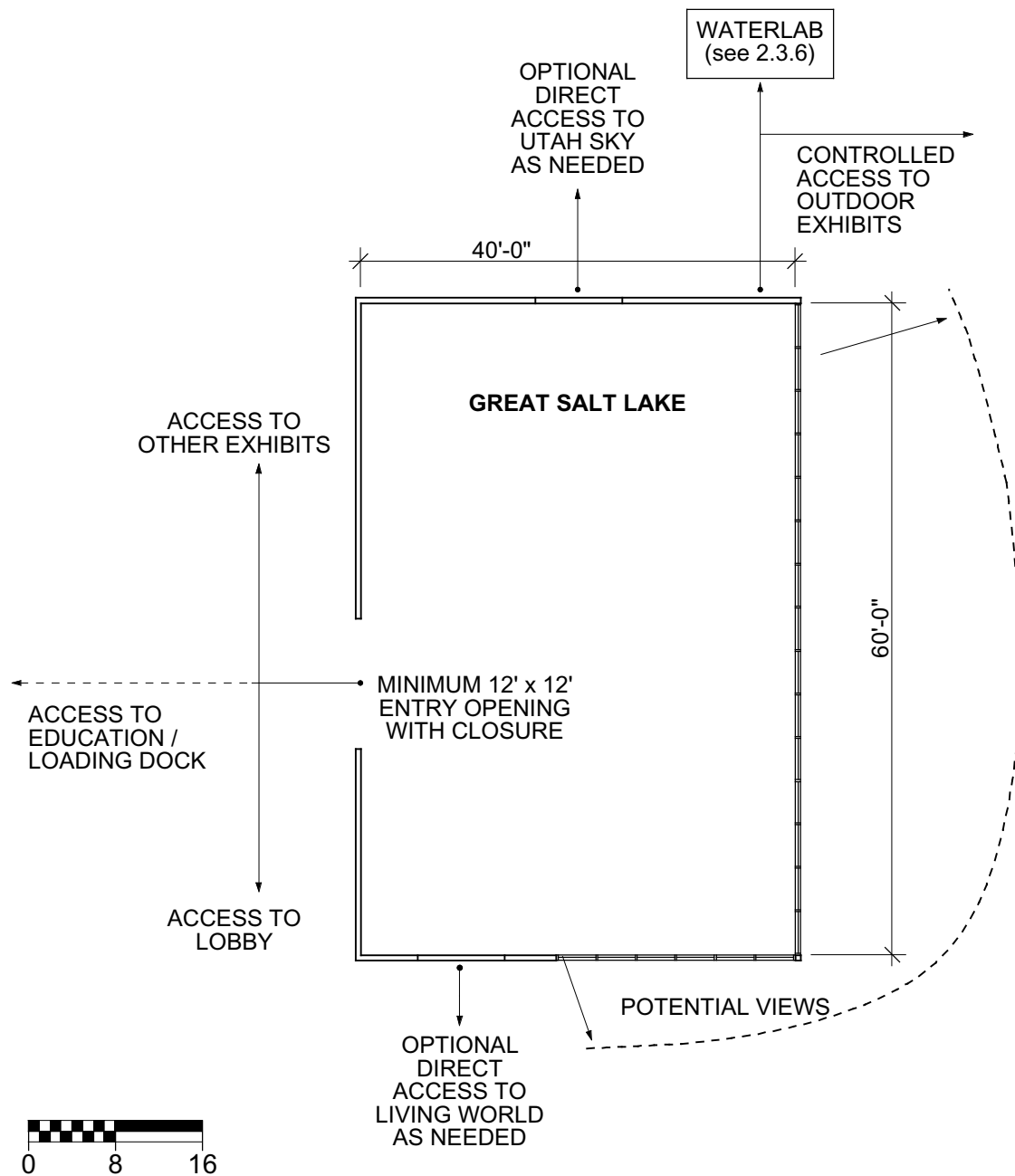
Phone/Data: Network connections along walls at 10' o.c and in floors.

Other: Pre-action Sprinkler System.

Furnishings and Equipment: This space will accommodate custom-designed exhibit components, artifacts, collection items, and may have extensive A/V and IT requirements. Supporting infrastructure must be carefully coordinated during the design phase.

Notes: The architectural character and final materials palette for this space will be largely determined by exhibition elements that have not been designed at the time of preparing this program. For current architectural costing purposes, this space is to be considered "shell space."

Prototype Plan:



Notes: The diagram above is highly abstracted and should not be literally accepted as representing a recommended plan shape or recommended proportions. Design of the space must be carefully coordinated with the final exhibit design and surrounding spaces.

Description

Function: Public exhibition space focusing on issues and ideas affecting Utah's natural environment and human's place in it.

Capacity: --

Net Area: 1500 nsf (including dedicated exhibit support spaces, excluding classrooms, labs, and outdoor areas).

Adjacency/Access

Adjacent to: Futures Forum.

Access to: Lobby, Living Worlds Observatory, Native Voices Observatory, Loading Dock (or Freight Elevator).

Design Criteria

Architectural

Character: Forum for thought, high-tech, accessible, open, collegial, community gallery (refer to Interpretive Plan for additional criteria).

Openings: View to Salt Lake City and Wasatch Front. Minimum 12' x 12' entry with closure system as required by security/fire separation.

Ceiling Height/Materials: 12' minimum / Painted exposed structure with acoustic baffles.

Walls: Taped gypsum board over fire-retardant treated plywood.

Floors: Sealed concrete, level.

Other:

Systems

Structural: Building Standard (see Structural Section 4.3.2). 150 psf live load. Forklift loads. Column free.

Mechanical: Environment A.2, to be verified with final exhibition design (see Mechanical Section 4.3.3).

Lighting: Highly flexible track lighting. Housecleaning lights. Controllable natural light.

Power: 120 v. quad convenience outlets 10' o.c. along wall perimeter. Three-280 v. flush floor outlets.

Clean power for A/V.

Plumbing: As required by exhibits. No overhead pressurized water piping or waste piping.

Security: High Security (see Electrical Section 4.3.6).

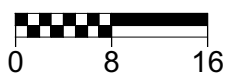
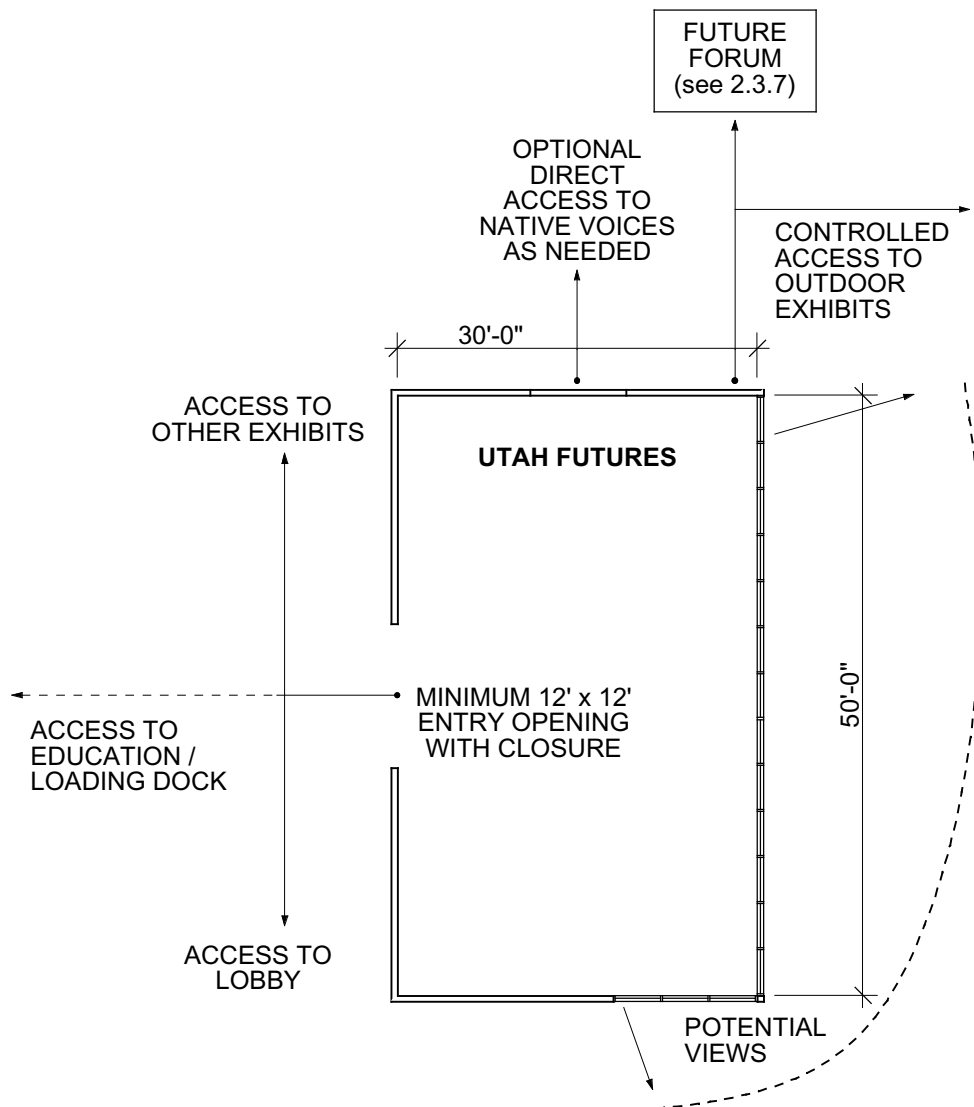
Phone/Data: Network connections along walls at 10' o.c. and in floors.

Other: Pre-action Sprinkler System.

Furnishings and Equipment: This space will accommodate custom-designed exhibit components, artifacts, collection items, and may have extensive A/V and IT requirements. Supporting infrastructure must be carefully coordinated during the design phase.

Notes: The architectural character and final materials palette for this space will be largely determined by exhibition elements that have not been designed at the time of preparing this program. For current architectural costing purposes, this space is to be considered "shell space." The Future Forum will be an integral part of this observatory, less a separate classroom, more an extension of the gallery.

Prototype Plan:



Notes: The diagram above is highly abstracted and should not be literally accepted as representing a recommended plan shape or recommended proportions. Design of the space must be carefully coordinated with the final exhibit design and surrounding spaces.

2.2.1 Changing Exhibitions A

5.3.2 Public Program Spaces

Description

Function: Exhibition gallery used to mount traveling and temporary exhibitions. Both loan and museum generated exhibitions will be mounted.

Capacity: Travelling exhibitions up to 5000 sf.

Net Area: 5000 nsf.

Adjacency/Access

Adjacent to: Changing Exhibitions B.

Access to: Lobby, Loading Dock (or Freight Elevator), other Exhibition galleries, Exhibits Workshops, Store, Forklift access to Loading Dock, Temporary Exit, and Freight Elevator.

Design Criteria

Architectural

Character: Highly refined to allow maximum flexibility.

Openings: At least one passage opening measuring 12'w x 12' h with closure system as required for security/fire/environmental separation.

Ceiling Height/Materials: One story, 15' to 18' maximum / Painted skim coat plaster

Walls: Skim coat plaster over gypsum board with plywood backup.

Floors: Wood or modular carpet tiles.

Other: Controllable natural light is desired only if fully blockable.

Systems

Structural: Building Standard (see Mechanical Section 4.3.3). 150 psf live load; Forklift loads. Column free.

Mechanical: Environment A.1 (see Mechanical Section 4.3.3). HVAC separate from rest of building.

Lighting: Flexible grid lighting. Housecleaning lighting.

Power: 120 v. quad convenience outlets 10' o.c. along wall perimeter. In-floor full grid air, power, data access; and surround sound capacity.

Plumbing: No pressurized overhead water or waste piping.

Security: High Security (see Electrical Section 4.3.6).

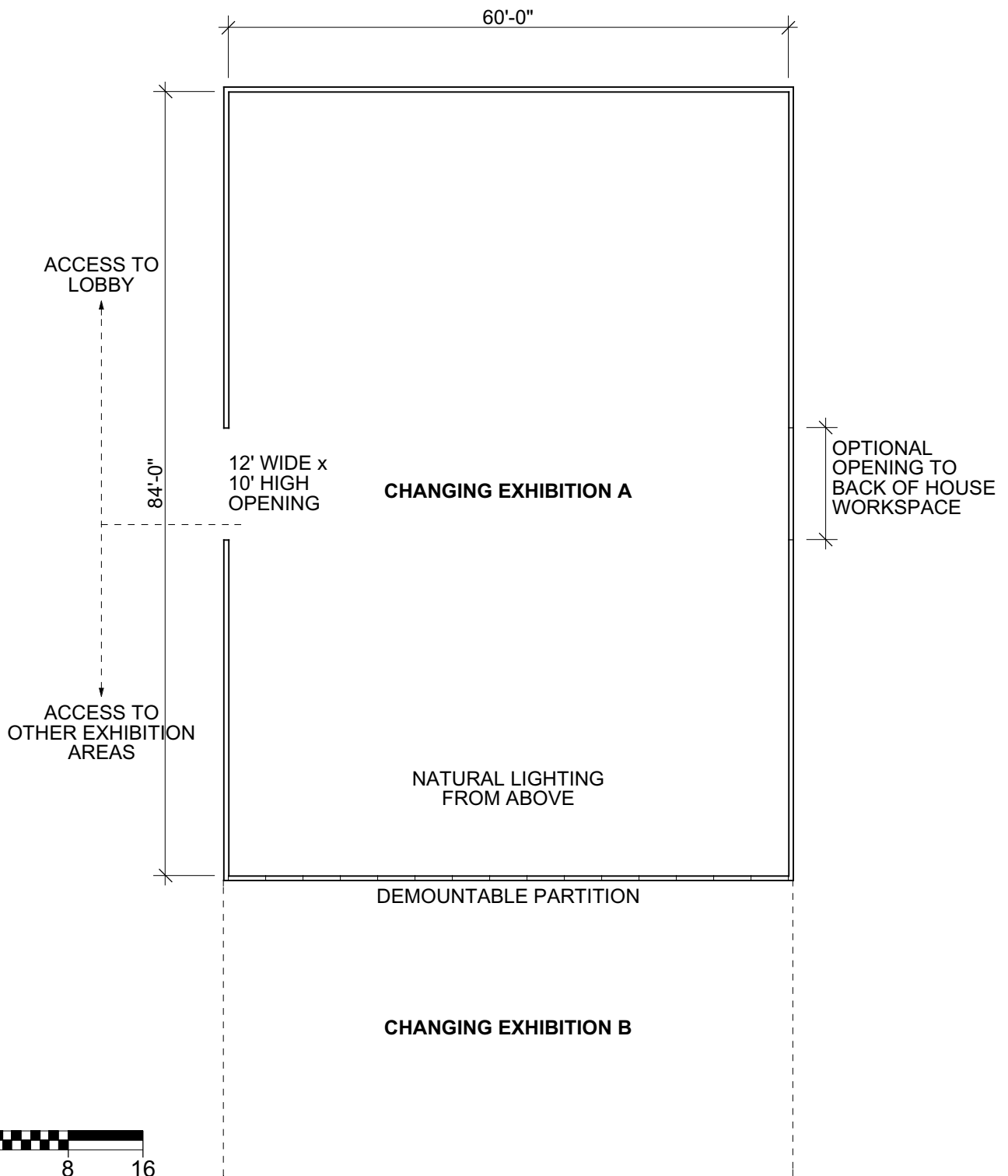
Phone/Data: Network connections along walls at 10' o.c. and in floors.

Other: Pre-action Sprinkler System.

Furnishings and Equipment: Vitrines, panels, and platforms used intermittently. Stored offsite. Raised floor possible where forklift access not required.

Notes: Demountable nailable full height wall between Changing Exhibition A and Changing Exhibition B. No windows. Airlock entrances separate from rest of building to maintain relative humidity. Grid system demountable floor-to-ceiling moveable walls, no built-in hangers for artwork -- just patchable surface.

Prototype Plan:



Notes:

2.2.2 Changing Exhibitions B

5.3.2 Public Program Spaces

Description

Function: Exhibition gallery used to mount traveling and temporary exhibitions. Both loan and museum generated exhibitions will be mounted.

Capacity: Travelling exhibitions up to 2500 sf.

Net Area: 2500 nsf.

Adjacency/Access

Adjacent to: Changing Exhibitions A.

Access to: Lobby, Loading Dock (or Freight Elevator), other Exhibition galleries, Exhibits Workshops, Store, Forklift access to Loading Dock, Temporary Exit and Freight Elevator.

Design Criteria

Architectural

Character: Highly refined to allow maximum flexibility.

Openings: At least one passage opening measuring 12'w x 12' h with closure system as required for security/fire/environmental separation.

Ceiling Height/Materials: One story, 15' to 18' maximum / Painted skim coat plaster.

Walls: Skim coat plaster over gypsum board with plywood backup.

Floors: Wood or modular carpet tiles.

Other: Controllable natural light is desired only if fully blockable

Systems

Structural: Building Standard (see Mechanical Section 4.3.3). 150 psf live load. Forklift loads. Column free.

Mechanical: Environment A.1 (see Mechanical Section 4.3.3). HVAC separate from rest of building.

Lighting: Flexible grid lighting. Housecleaning lighting.

Power: 120 v. quad convenience outlets 10' o.c. along wall perimeter. In-floor full grid air, power, data access; and surround sound capacity.

Plumbing: No pressurized overhead water or waste piping.

Security: High Security (see Electrical Section 4.3.6).

Phone/Data: Network connections along walls at 10' o.c and in floors.

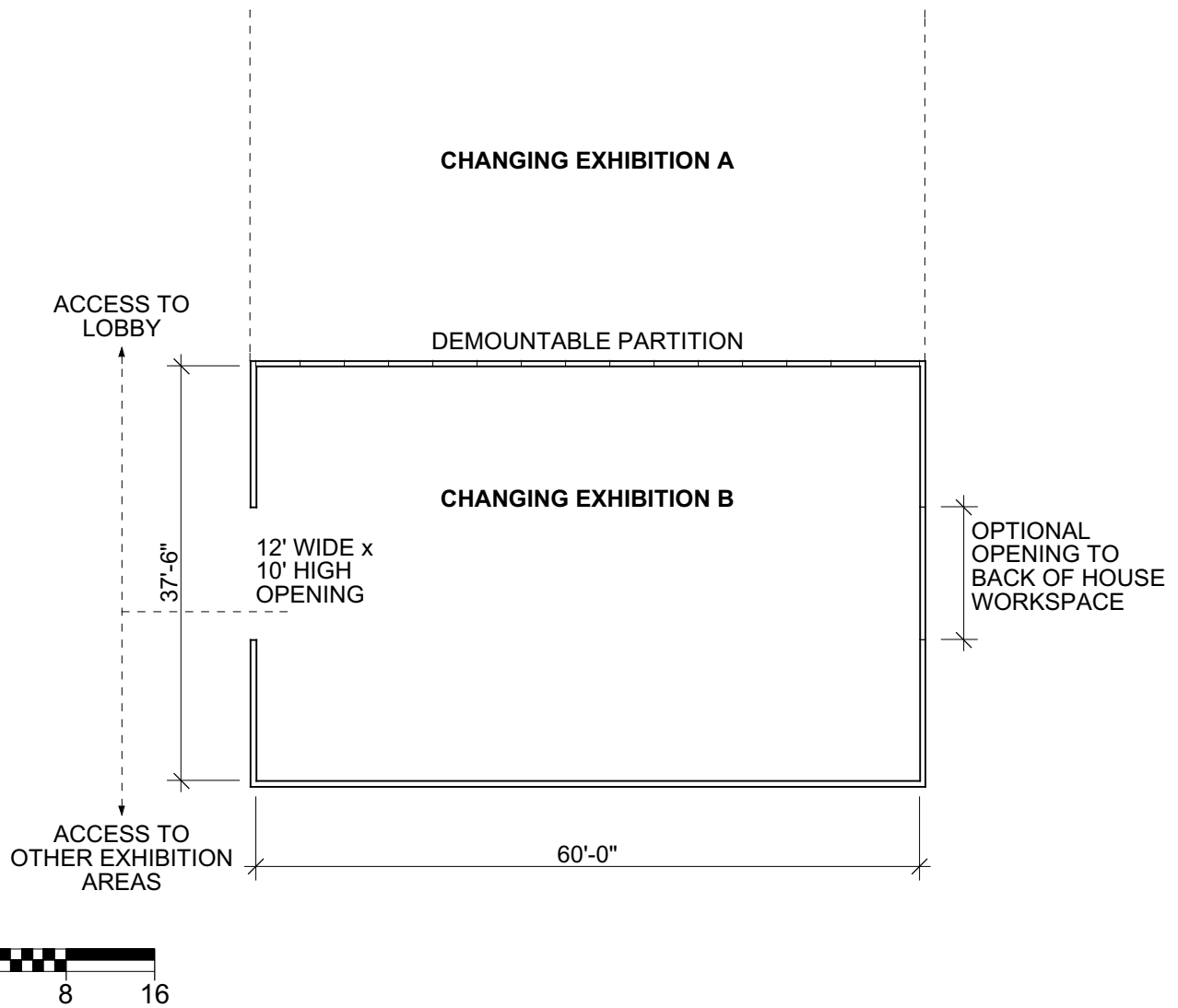
Other: Pre-action Sprinkler System.

Furnishings and Equipment: Vitrines, panels, and platforms used intermittently. Stored offsite. Raised floor possible where forklift access not required.

Notes: Demountable nailable full height wall between Changing Exhibition A and Changing Exhibition B. No windows. Airlock entrances separate from rest of building to maintain required relative humidity.

Grid system demountable floor-to-ceiling moveable walls, no built-in hangers for artwork - just patchable surface.

Prototype Plan:



Notes:

2.3.1 Rocklab (dry classroom)/Dynamic Landscape

5.3.2 Public Program Spaces

Description

Function: Public dry classroom for class-type and demonstration-type educational programs related to the exhibits in the Dynamic Landscape exhibit gallery.

Capacity: 36 People (6 seats at 6 tables).

Net Area: 700 nsf.

Adjacency/Access

Adjacent to: Embedded in Dynamic Landscape Observatory.

Access to: Exhibition gallery circulation, exterior (through intermediate “airlock” space), Education Staff Areas, Research/Curator Offices & Labs, Collections.

Design Criteria

Architectural

Character: Inviting, exciting and inspiring lab-like environment, should reflect character of Dynamic Landscape Observatory (refer to Interpretive Plan for additional criteria).

Openings: Moveable wall panels full width and height of one side of room to allow space to be completely open to adjacent exhibit gallery.

Ceiling Height/Materials: 12' height preferred / Acoustical ceiling tiles (2x2) with dropped gypsum board soffits.

Walls: Painted gypsum board.

Floors: Seamless resilient flooring.

Other: Built-in solid surface counter with continuous lockable wall cabinets above and lockable cabinets / drawers below. Electrically operated, full-height, non-fabric moveable wall panels (STC 50).

Systems

Structural: Building Standard (see Structural Section 4.3.2). 150 psf live load. Forklift loads.

Mechanical: Environment C, coordinate with adjacent gallery (see Mechanical Section 4.3.3).

Lighting: Indirect ambient above cabinets, direct tasklighting, track lighting at bulletin/cork/white board.

Power: Power for moveable partition. Power for roll-down projection screen. Electrical outlets above counter and at 10' oc along walls. Seven 110 v. flush floor outlets under tables.

Plumbing: Deep lab-type stainless steel sink with water fountain spout.

Security: Medium Security (see Electrical Section 4.3.6).

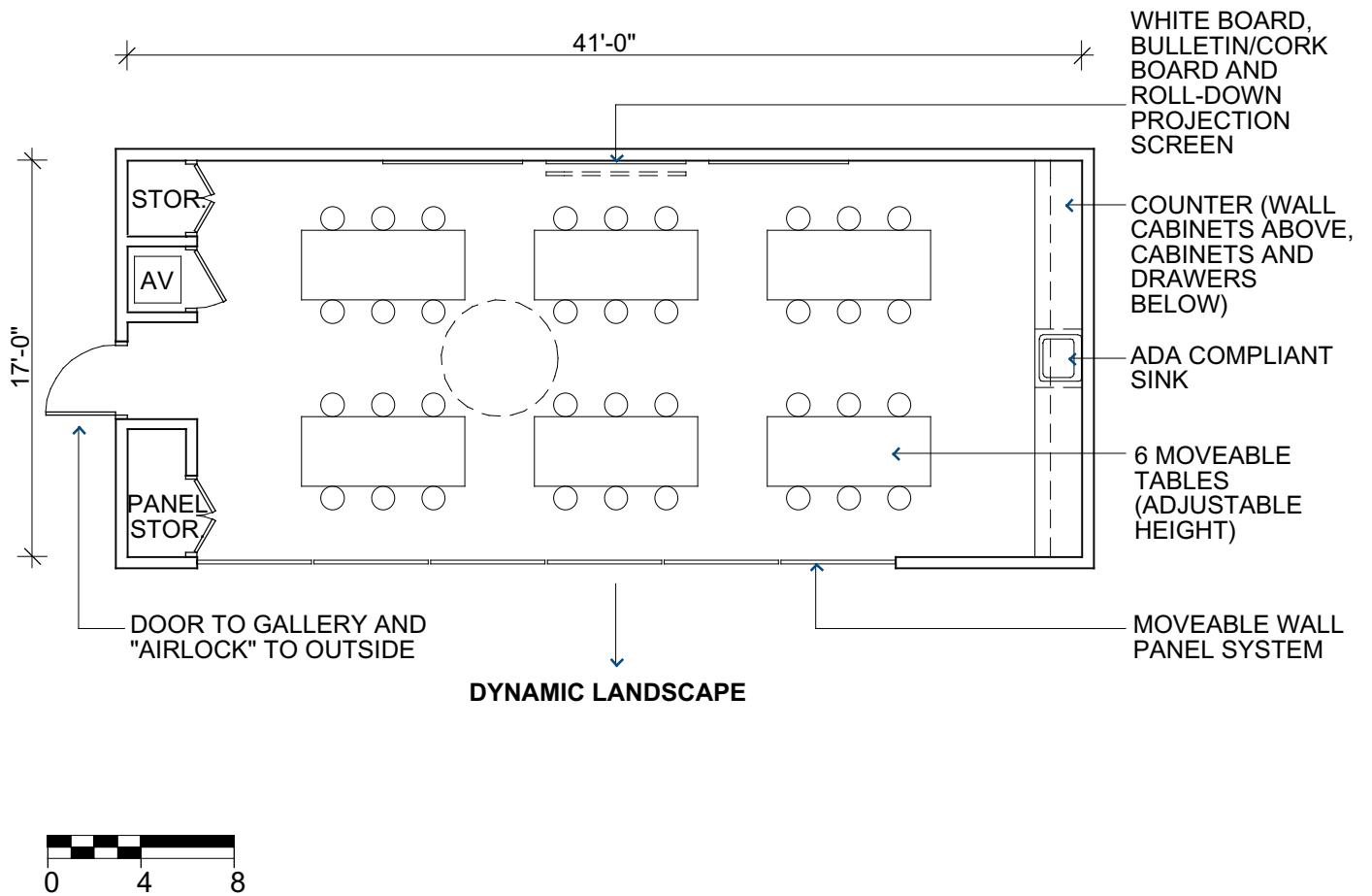
Phone/Data: Telephone and network connections at 10' oc. Wireless internet.

Other:

Furnishings and Equipment: Six 3x7 adjustable height tables with 36 stools. Moveable A/V console with LCD projector, DVD/CD player, connection for computer, speakers, VCR (project via LCD projector). Bulletin / cork boards and large white board. Roll-down projection screen.

Notes: Storage room should be secure for storage of computer and AV.

Prototype Plan:



Notes:

2.3.2 Fossilab (wet classroom) / Past Worlds

5.3.2 Public Program Spaces

Description

Function: Public wet classroom for class-type and demonstration-type educational programs related to the exhibits in the Past Worlds exhibit gallery.

Capacity: 36 People (6 seats at 6 tables).

Net Area: 700 nsf.

Adjacency/Access

Adjacent to: Embedded in Past Worlds Observatory.

Access to: Exhibition gallery circulation, exterior “outdoor classroom” (geology/soil/paleontology focus) through intermediate “airlock” space, Education Staff Areas, Geological & Paleological Research/ Curator Offices & Labs, Geological Collections.

Design Criteria

Architectural

Character: Inviting, exciting and inspiring lab-like environment, should reflect characters of Past Worlds Observatory (refer to Interpretive Plan for additional criteria).

Openings: Two large windows to adjacent exhibit gallery.

Ceiling Height/Materials: 12' height preferred / Acoustical ceiling tiles (2x2) with dropped gypsum board soffits.

Walls: Painted gypsum board.

Floors: Seamless resilient flooring.

Other: Built-in solid surface counters (lab-type) with continuous lockable wall cabinets above and lockable cabinets / drawers below.

Systems

Structural: Building Standard (see Structural Section 4.3.2). 150 psf live load. Forklift loads.

Mechanical: Environment C (see Mechanical Section 4.3.3).

Lighting: Indirect ambient above cabinets, direct tasklighting, track lighting at bulletin/cork/white board.

Power: Power for roll-down projection screen. Electrical outlet strips above counter and outlets at 10' oc along walls.

Plumbing: Three deep lab-type stainless steel sinks capable of handling soil disposal. Floor drain. Water fountain spout at one sink.

Security: Medium Security (see Electrical Section 4.3.6).

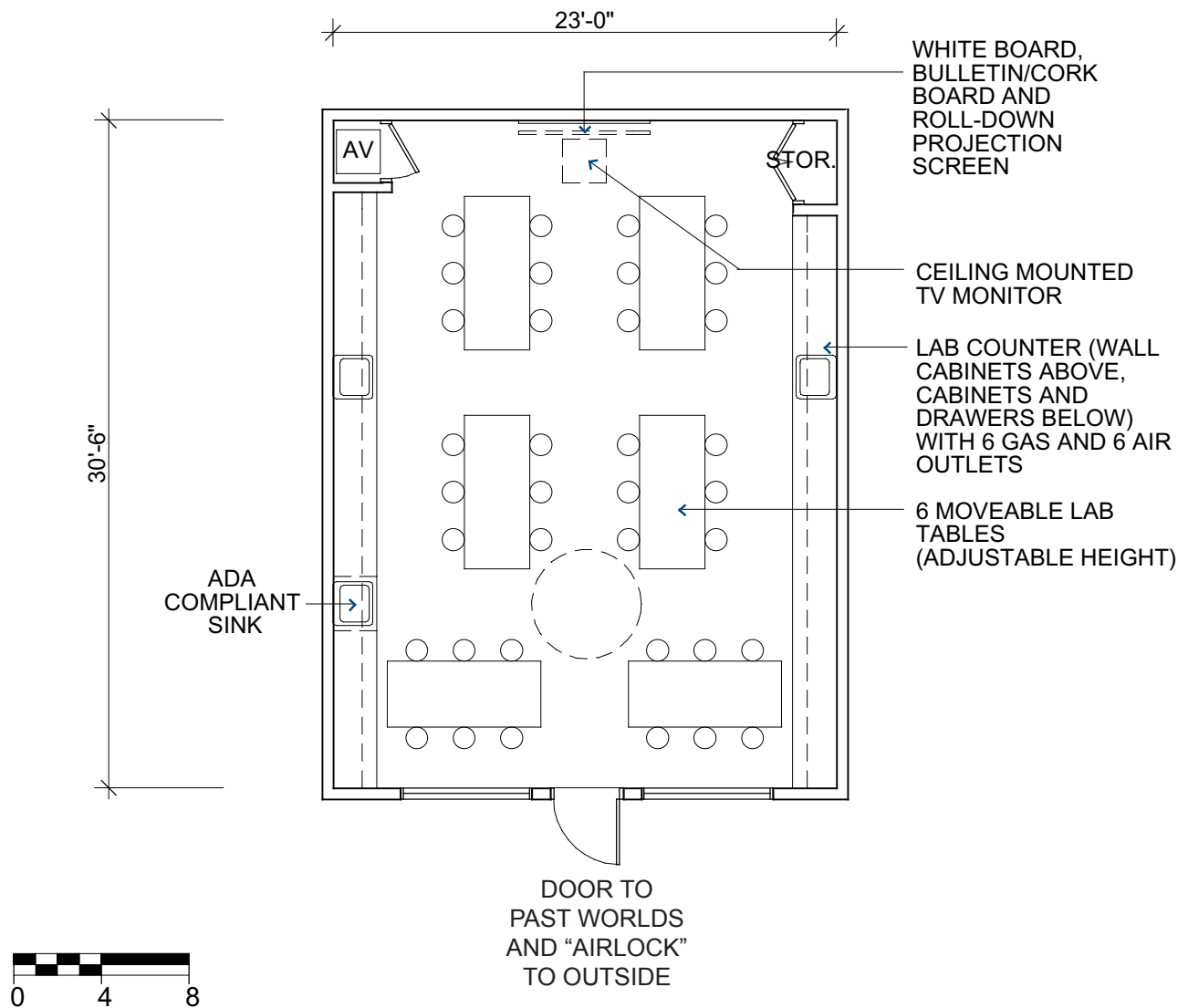
Phone/Data: Telephone and network connections at 10' oc. Wireless internet.

Other: Six gas and air outlets at counters.

Furnishings and Equipment: Power should be capable to operate multiple pieces of lab equipment simultaneously. Six 3x7 adjustable height tables (lab-type surface) with 36 stools. Moveable A/V console with LCD projector, DVD/CD player, connection for computer, speakers, VCR (project via LCD projector). Bulletin / cork boards and large white board. Roll-down projection screen. Ceiling-mounted TV monitor. Safety equipment as required.

Notes: Storage rooms should be secure for storage of computers and microscopes and AV.

Prototype Plan:



Notes:

Description

Function: Public dry classroom for class-type and demonstration-type educational programs related to the exhibits in the Past Worlds exhibit gallery.

Capacity: 36 People (6 seats at 6 tables).

Net Area: 700 nsf.

Adjacency/Access

Adjacent to: Embedded in Past Worlds Observatory.

Access to: Exhibition gallery circulation, exterior (through intermediate "airlock" space), Education Staff Areas, Anthropology Research/Curator Offices & Labs and Anthropology Collections.

Design Criteria

Architectural

Character: Inviting, exciting and inspiring lab-like environment, should reflect character of Past Worlds Observatory (refer to Interpretive Plan for additional criteria).

Openings: Moveable wall panels full width and height of one side of room to allow space to be completely open to adjacent exhibit gallery.

Ceiling Height/Materials: 12' height preferred / Acoustical tiles (2x2) with dropped gypsum board soffits.

Walls: Painted gypsum board.

Floors: Seamless resilient flooring.

Other: Built-in solid surface counter with continuous lockable wall cabinets above and lockable cabinets / drawers below. Electrically operated, full-height, non-fabric moveable wall panels (STC 50).

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment C, coordinate with adjacent gallery (see Mechanical Section 4.3.3).

Lighting: Indirect ambient above cabinets, direct tasklighting, track lighting at bulletin/cork/white board.

Power: Power for moveable partition. Power for roll-down projection screen. Electrical outlets above counter and at 10' oc along walls. Seven 110 v. flush floor outlets.

Plumbing: Deep lab-type stainless steel sink with water fountain spout.

Security: Medium Security (see Electrical Section 4.3.6).

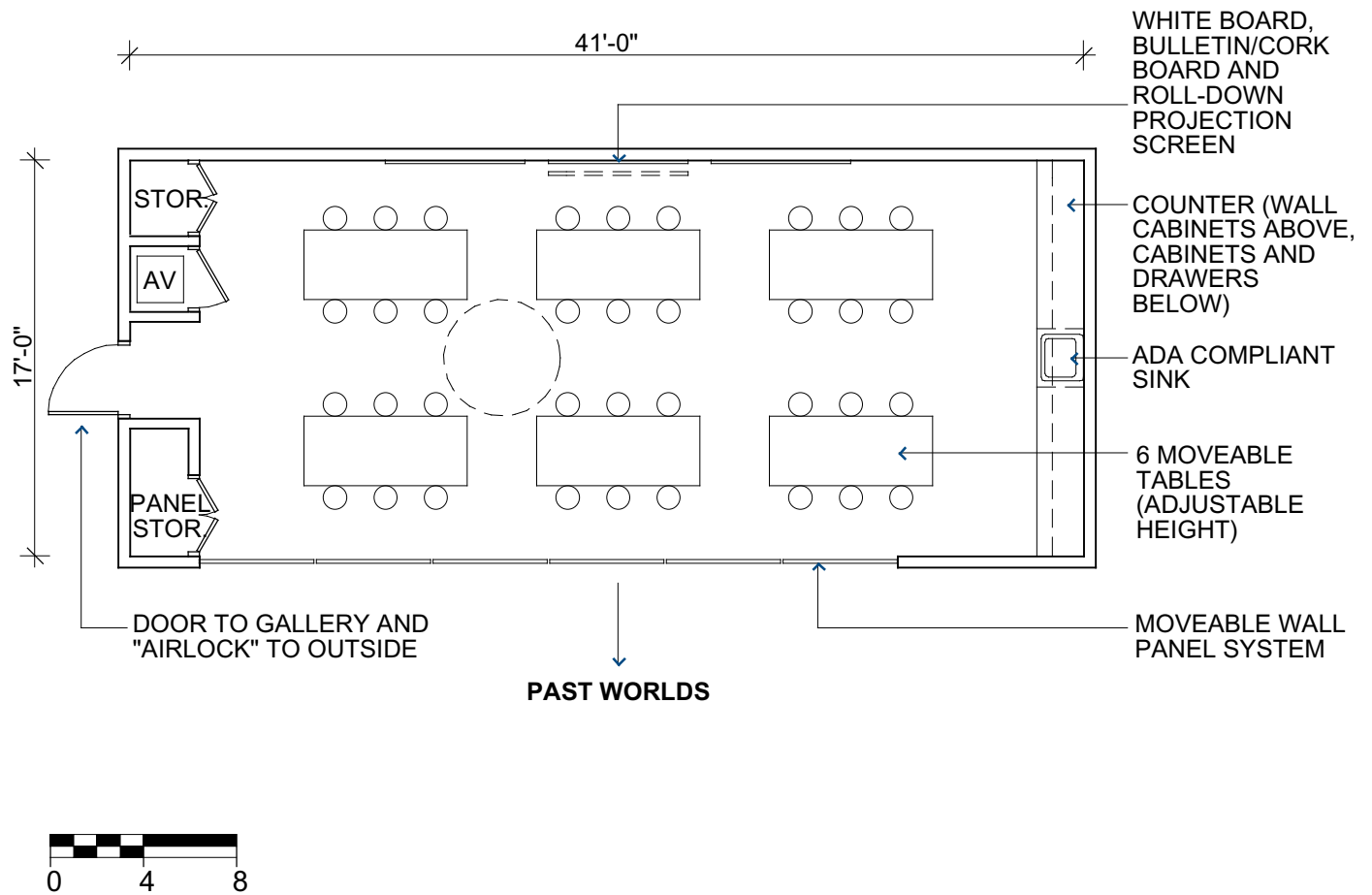
Phone/Data: Telephone and network connections at 10' oc. Wireless internet.

Other:

Furnishings and Equipment: Six 3x7 adjustable height tables with 36 stools. Moveable A/V console with LCD projector, DVD/CD player, connection for computer, speakers, VCR (project via LCD projector). Bulletin / cork boards and large white board. Roll-down projection screen.

Notes: Storage room should be secure for storage of computers and AV.

Prototype Plan:



Notes:

Description

Function: Public lab classroom for class-type and demonstration-type educational programs related to the exhibits in the Living World exhibit gallery.

Capacity: 36 People (6 seats at 6 tables).

Net Area: 700 nsf.

Adjacency/Access

Adjacent to: Embedded in Living World Observatory.

Access to: Exhibition gallery circulation, Genetics Research Lab, Education Staff Areas, Biological Research/Curator Offices & Labs, Biological Collections and Orientation Theater/Lecture Hall.

Design Criteria

Architectural

Character: Inviting, exciting and inspiring lab-like environment, should reflect character of Living World Observatory (refer to Interpretive Plan for additional criteria).

Openings: Two large windows to adjacent exhibit gallery.

Ceiling Height/Materials: 12' height preferred / Acoustical tiles (2x2) with dropped gypsum board soffits.

Walls: Painted gypsum board.

Floors: Seamless resilient flooring

Other: Built-in solid surface counters (lab-type) with continuous lockable wall cabinets above and lockable cabinets / drawers below.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment E (see Mechanical Section 4.3.3).

Lighting: Indirect ambient above cabinets, direct tasklighting, track lighting at bulletin/cork/white board.

Power: Power for hood. Power for roll-down projection screen. Electrical outlet strips above counter and outlets at 10' oc along walls. Seven 110 v. flush floor outlets.

Plumbing: Four deep lab-type stainless steel sinks capable of handling soil disposal. Emergency shower and eyewash station. Floor drain. Water fountain spout at one sink.

Security: Medium Security (see Electrical Section 4.3.6).

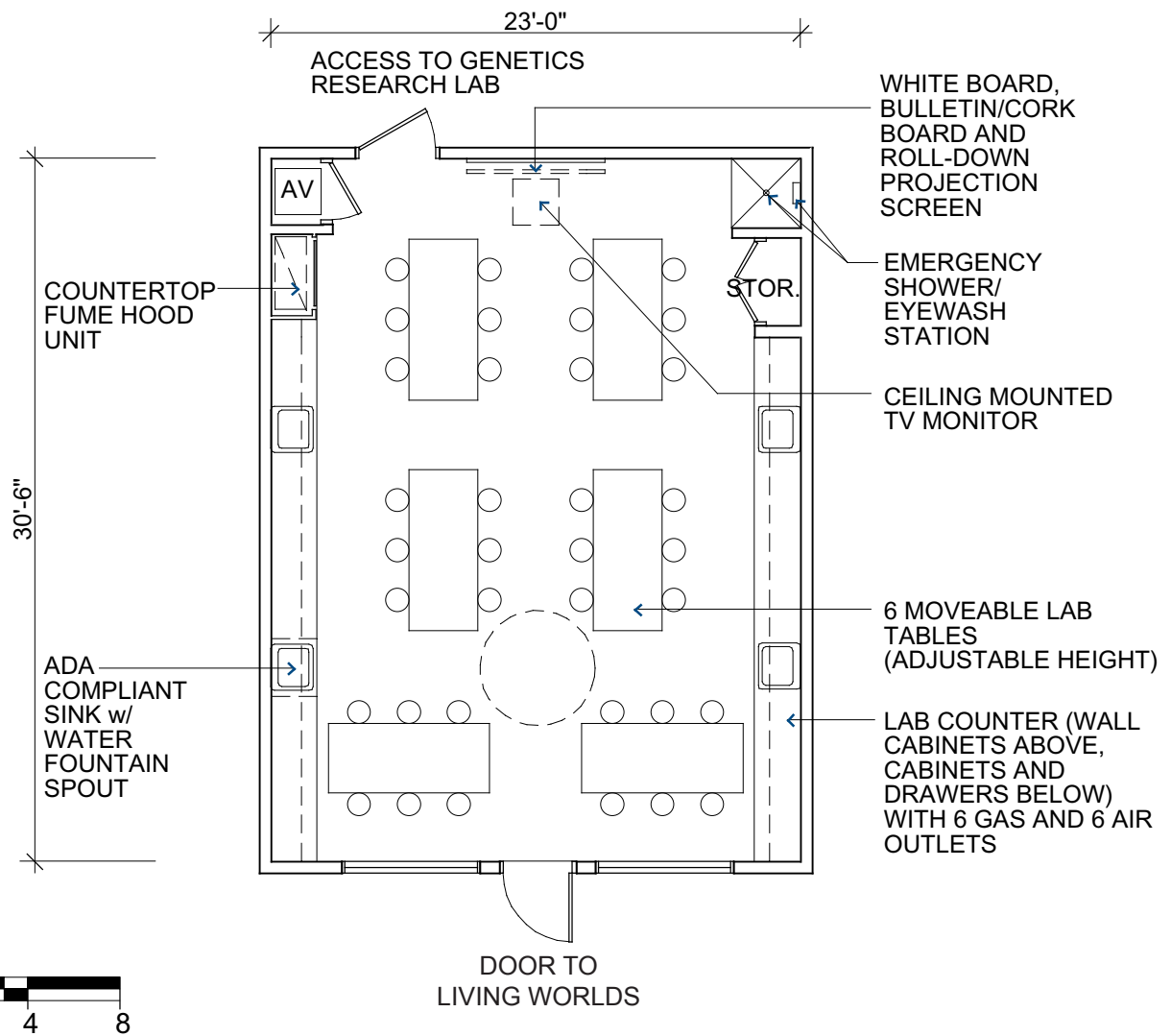
Phone/Data: Telephone and network connections at 10' oc. Wireless internet.

Other: Six gas outlets at counters.

Furnishings and Equipment: Power should be capable to operate multiple pieces of lab equipment simultaneously. Above-counter hood. Six 3x7 adjustable height tables (lab-type surface) with 36 stools. Moveable A/V console with LCD projector, DVD/CD player, connection for computer, speakers, VCR (project via LCD projector). "Smart" board (computer projection/capture, write on). Microscopes (dissecting and compound) with projection system. Bulletin / cork boards and large white board. Roll-down projection screen. Ceiling-mounted TV monitor. Safety equipment as required (including fire blanket and first aid kit).

Notes: Storage cabinets should be secure for storage of computers and microscopes and AV. Special storage for chemicals required.

Prototype Plan:



Notes:

Description

Function: Public wet classroom for class-type and demonstration-type educational programs related to the exhibits in the Living World exhibit gallery.

Capacity: 36 People (6 seats at 6 tables).

Net Area: 700 nsf.

Adjacency/Access

Adjacent to: Embedded in Living World Observatory.

Access to: Exhibition gallery circulation, exterior “outdoor classroom” component or solarium/herbarium/vivarium (through intermediate “airlock” space), Education Staff Areas, Biological Research Curator Offices and Labs, Biological Collections.

Design Criteria

Architectural

Character: Inviting, exciting and inspiring lab-like environment, should reflect character of Living World Observatory (refer to Interpretive Plan for additional criteria).

Openings: Two large windows to adjacent exhibit gallery.

Ceiling Height/Materials: 12' height preferred / Acoustical tiles (2x2) with dropped gypsum board soffits.

Walls: Painted gypsum board.

Floors: Seamless resilient flooring.

Other: Built-in solid surface counters (lab-type) with continuous lockable wall cabinets above and lockable cabinets / drawers below.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment E (see Mechanical Section 4.3.3).

Lighting: Indirect ambient above cabinets, direct tasklighting, track lighting at bulletin/cork/white board.

Power: Power for roll-down projection screen. Electrical outlet strips above counter and outlets at 10' oc along walls. Seven 110 v. flush floor outlets.

Plumbing: Three deep lab-type stainless steel sinks capable of handling soil disposal. Floor drain. Water fountain spout.

Security: Medium Security (see Electrical Section 4.3.6).

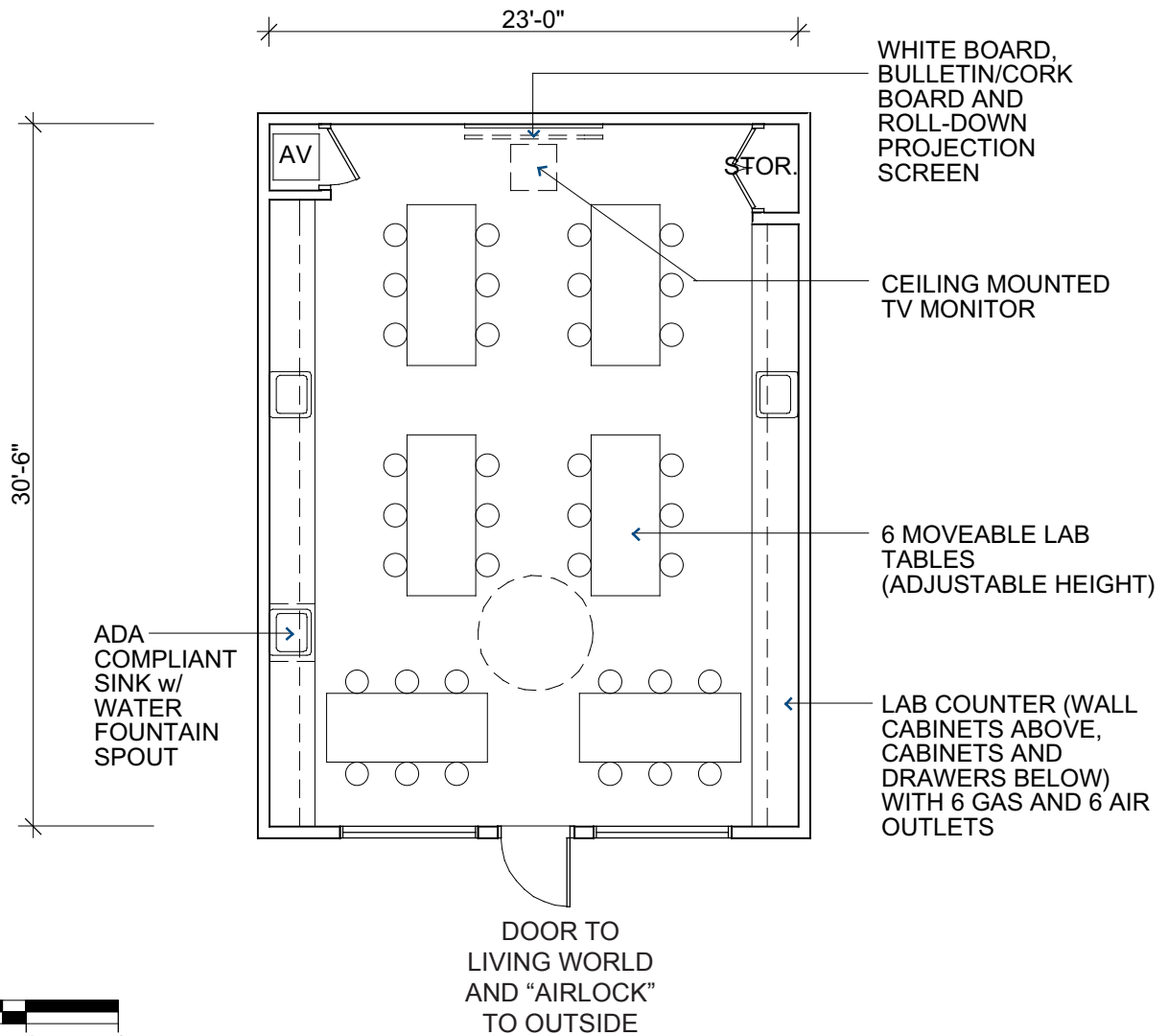
Phone/Data: Phone and network connections at 10' oc. Wireless internet.

Other: Six gas and air outlets at counters.

Furnishings and Equipment: Power should be capable to operate multiple pieces of lab equipment simultaneously. Above-counter hood. Six 3x7 adjustable height tables (lab-type surface) with 36 stools. Moveable A/V console with LCD projector, DVD/CD player, connection for computer, speakers, VCR (project via LCD projector). Bulletin / cork boards and large white board. Roll-down projection screen. Ceiling-mounted TV monitor. Safety equipment as required.

Notes: Storage rooms should be secure for storage of computers and microscopes and AV.

Prototype Plan:



Notes:

Description

Function: Public wet classroom for class-type and demonstration-type educational programs related to the exhibits in the Utah Sky and Great Salt Lake exhibit galleries.

Capacity: 36 People (6 seats at 6 tables).

Net Area: 700 nsf.

Adjacency/Access

Adjacent to: Embedded between Utah Sky Observatory and Great Salt Lake Observatory.

Access to: Exhibition gallery circulation, exterior (through intermediate “airlock” space), Education Staff Areas, Research/Curator Offices and Labs, Collections.

Design Criteria**Architectural**

Character: Inviting, exciting and inspiring lab-like environment, should reflect character of Utah Sky and Great Salt Lake Observatories (refer to Interpretive Plan for additional criteria).

Openings: Two large windows to adjacent exhibit galleries. Window to W/NW for weather tracking and monitoring.

Ceiling Height/Materials: 12' height preferred / Acoustical tiles (2x2) with dropped gypsum board soffits.

Walls: Painted gypsum board.

Floors: Seamless resilient flooring.

Other: Built-in solid surface counters (lab-type) with continuous lockable wall cabinets above and lockable cabinets / drawers below.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment E (see Mechanical Section 4.3.3).

Lighting: Indirect ambient above cabinets, direct tasklighting, track lighting at bulletin/cork/white board.

Power: Power for roll-down projection screen. Electrical outlet strips above counter and outlets at 10' oc along walls. Seven 110 v. flush floor outlets.

Plumbing: Three deep lab-type stainless steel sinks capable of handling soil disposal. Floor drain. Water fountain spout.

Security: Medium Security (see Electrical Section 4.3.6).

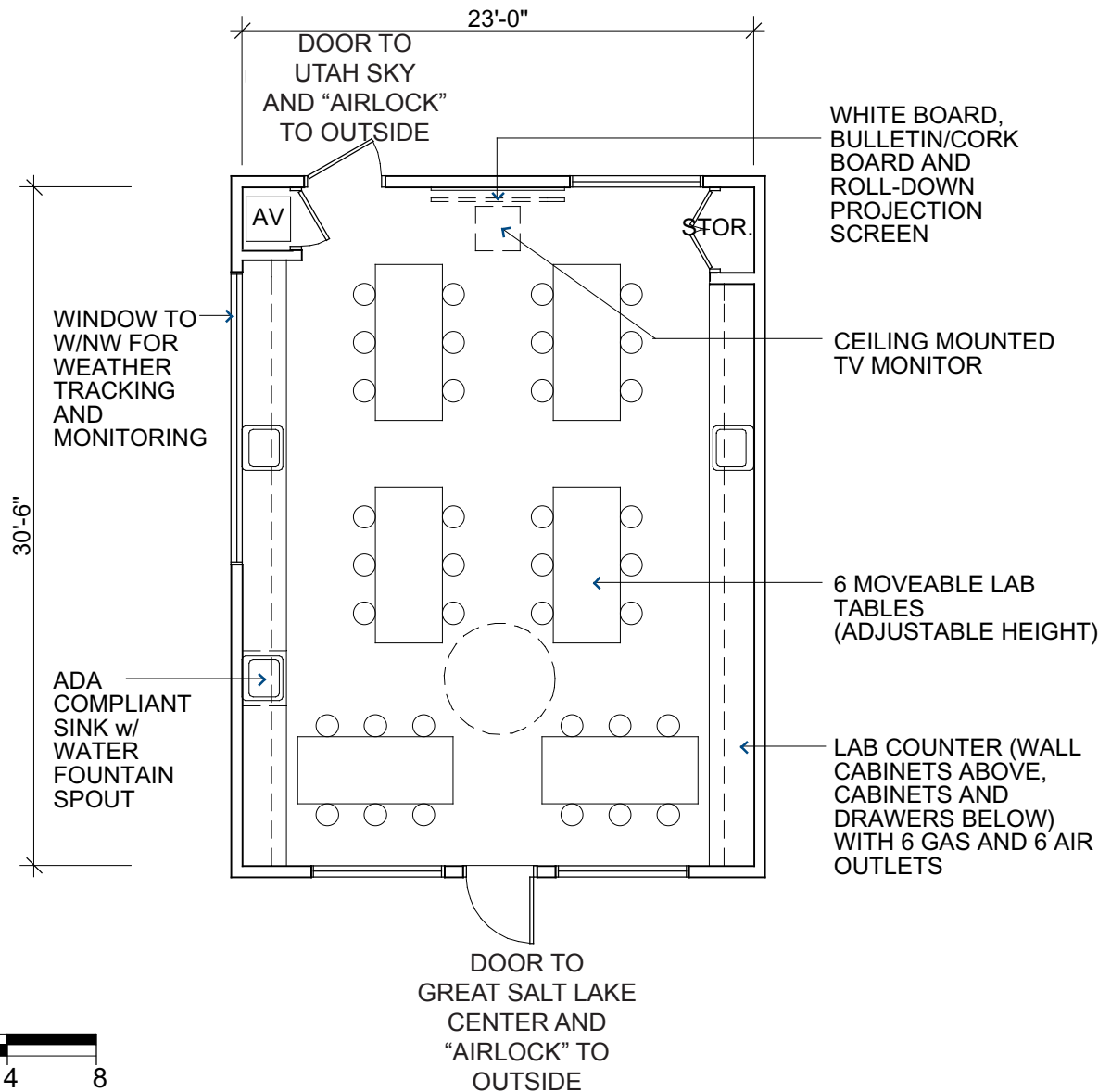
Phone/Data: Phone and network connections at 10' oc. Wireless internet.

Other: Six gas and air outlets at counters.

Furnishings and Equipment: Power should be capable to operate multiple pieces of lab equipment simultaneously. Above-counter hood. Six 3x7 adjustable height tables (lab-type surface) with 36 stools. Moveable A/V console with LCD projector, DVD/CD player, connection for computer, speakers, VCR (project via LCD projector). Bulletin / cork boards and large white board. Roll-down projection screen. Ceiling-mounted TV monitor. Safety equipment as required.

Notes: Storage rooms should be secure for storage of computers and microscopes and AV.

Prototype Plan:



Notes:

Description

Function: Public high-tech multipurpose meeting room, can be used for lectures, classes, conferences or meetings. Room should be able to accommodate meals.

Capacity: 200 people.

Net Area: 2000 nsf.

Adjacency/Access

Adjacent to: Embedded in Utah Futures Observatory.

Access to: Lobby, exhibition gallery circulation, Education Staff, Research/Curator Offices and Labs, Collections.

Design Criteria

Architectural

Character: Forum for thought, open, accessible, flexible (refer to Interpretive Plan for additional criteria).

Openings: Completely open to Utah Futures Gallery.

Ceiling Height/Materials: 12' height preferred / Acoustical tiles (2x2) with dropped gypsum board soffits.

Walls: Painted gypsum board.

Floors: Seamless resilient flooring.

Other:

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment E, coordinate with adjacent gallery (see Mechanical Section 4.3.3).

Lighting: Indirect ambient, direct tasklighting, track lighting at bulletin/cork/white board.

Power: Power for roll-down projection screen. Electrical outlets at 10' oc along walls. Twelve 110 v. flush floor outlets.

Plumbing: N/A.

Security: Medium Security (see Electrical Section 4.3.6).

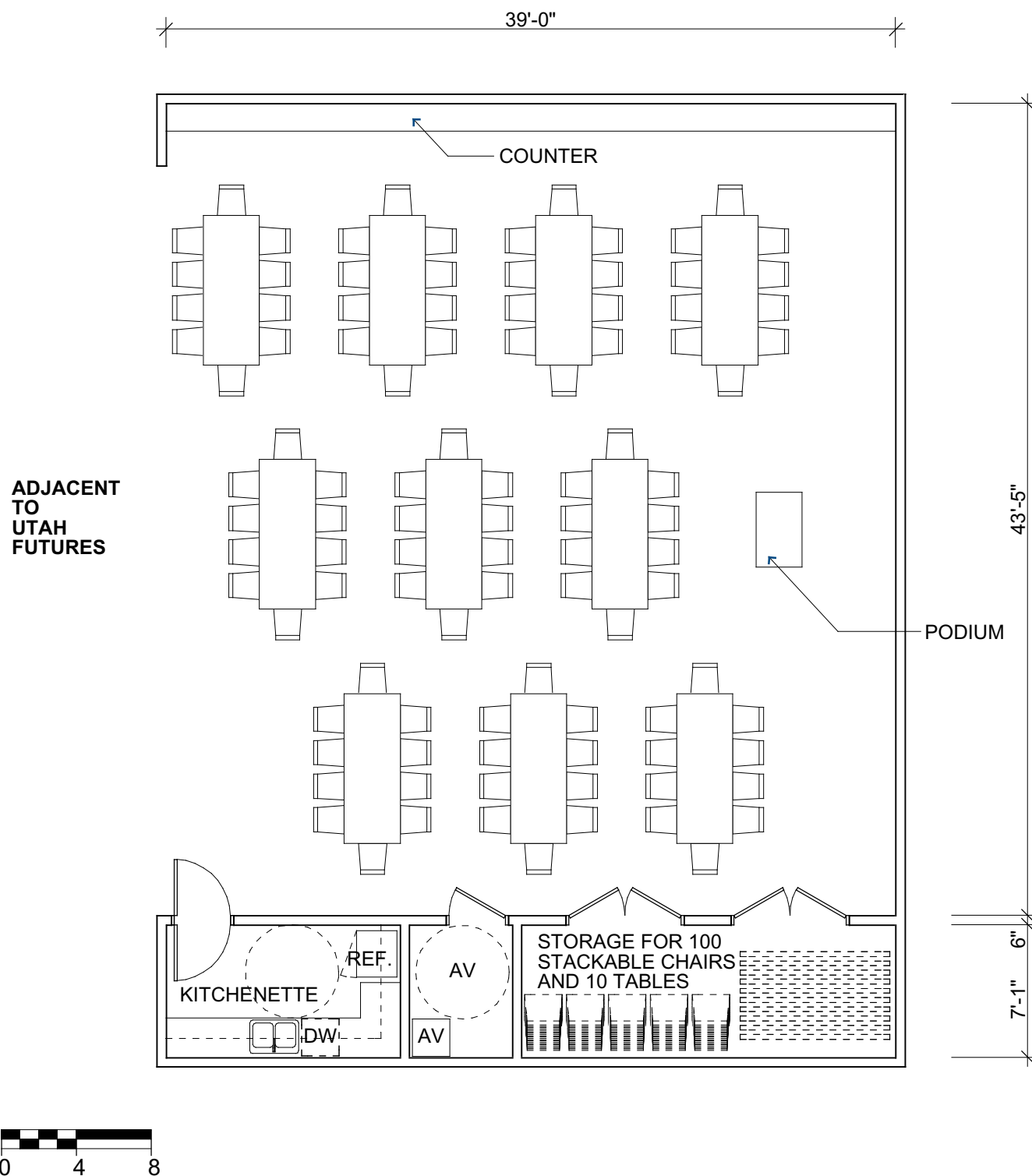
Phone/Data: Phone and network connections at 10' oc. Wireless internet.

Other:

Furnishings and Equipment: Moveable A/V console with speakers, podium, DVD/CD player, connection for computer, VCR (project via LCD projector). Ceiling mounted LCD projector. Built in sound system. "Smart" board (computer projection/capture, write on). Bulletin / cork boards and large white board. Roll-down projection screen. Network access to public. Large plasma screen.

Notes: Storage room should be secure for storage of computers and AV.

Prototype Plan:



Notes:

2.4.1 Orientation Theater / Lecture Hall Seating

5.3.2 Public Program Spaces

Description

Function: An intimate theater for orientation films, distance learning, lectures, panel discussions, corporate and staff events, presentations, and demonstrations.

Capacity: 143 fixed seats and HC locations (or 6 removable seats).

Net Area: 1800 nsf (including sound/light locks).

Adjacency/Access

Adjacent to: Lobby, public gallery circulation.

Access to: Public Toilets.

Design Criteria

Architectural

Character: Warm, welcoming, comfortable, collegial (refer to Interpretive Plan for additional criteria).

Openings: Sound and light absorption at public entry.

Ceiling Height/Materials: Varies, contoured to reflect sound to rear of chamber / Skimcoat plaster.

Walls: Acoustic; absorptive in rear 2/3; reflective in front 1/3.

Floors: Carpet.

Other:

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Dimmable incandescent downlights (houselights and backstage). Aisle lighting at seat ends.

Theatrical lighting at front. Spotlight over speaker.

Power: 120 v. convenience outlets for cleaning.

Plumbing: N/A

Security: University standard.

Phone/Data: Verify network connections at individual seats with Museum prior to design completion.

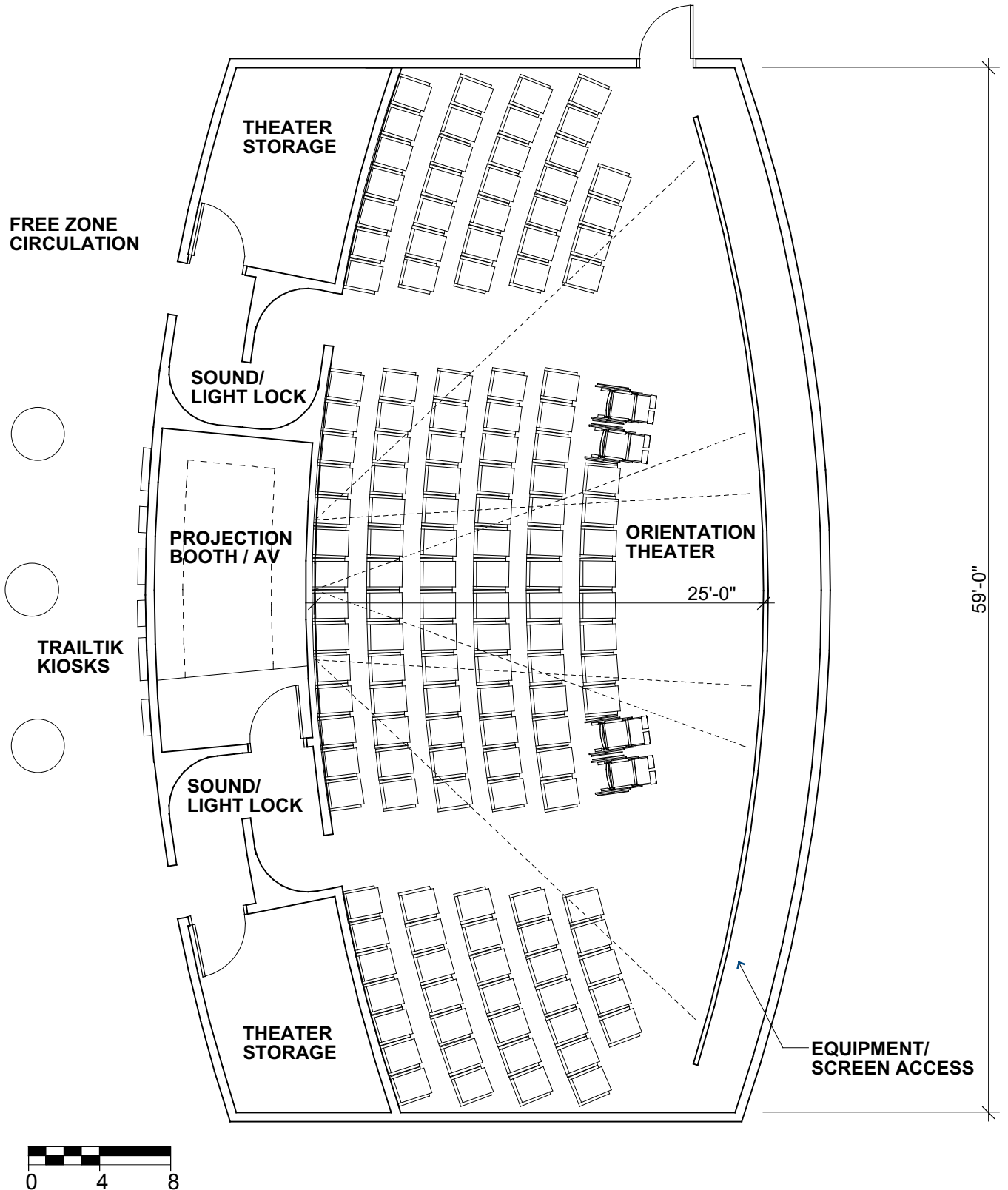
Verify A/V systems with Museum prior to design completion.

Other: Acoustic isolation from other space, mechanical noise.

Furnishings and Equipment: Fixed upholstered seating (without tablet arms) arranged in arc to allow audience to see each other. Man-lift with over-seating carriage (for lighting access). Ceiling-mounted LCD projector. Speakers, podium, A/V console, plasma screen, retractable screen, white board, public access to network via wireless. Review all A/V IT requirements during design.

Notes: Sloped floor. Should be available after hours. Placed between free (lobby) and pay zones so may be included in either depending on particular use.

Prototype Plan:



Notes:

Description

Function: Working spaces for A/V technicians and A/V equipment serving presentations in the theater.

Equipment for Trailtik kiosks.

Capacity: ---

Net Area: 150 nsf.

Adjacency/Access

Adjacent to: Audience chamber and other theater spaces, Lobby, Free Zone circulation.

Access to: Toilets, Loading Dock (or Freight Elevator).

Design Criteria

Architectural

Character: A/V control room.

Openings: 3' (minimum) entry door. Optically clear glass projection port with sliding black-out panels and clear projection to screen.

Ceiling Height/Materials: 8' minimum / Acoustical ceiling tile.

Walls: Sound absorbant except behind equipment racks.

Floors: Carpet.

Other: Dark color walls, ceiling, and floors.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D with additional ventilation for A/V equipment (see Mechanical Section 4.3.3).

Lighting: Emphasis on direct task lighting. Low level ambient lighting except for "lights up" set-up mode.

Power: Extensive 120 v. power in 4 gang wall outlets and power strips.

Plumbing: N/A (unless water cooled projector used).

Security: Medium Security (see Electrical Section 4.3.6). Monitored access recommended.

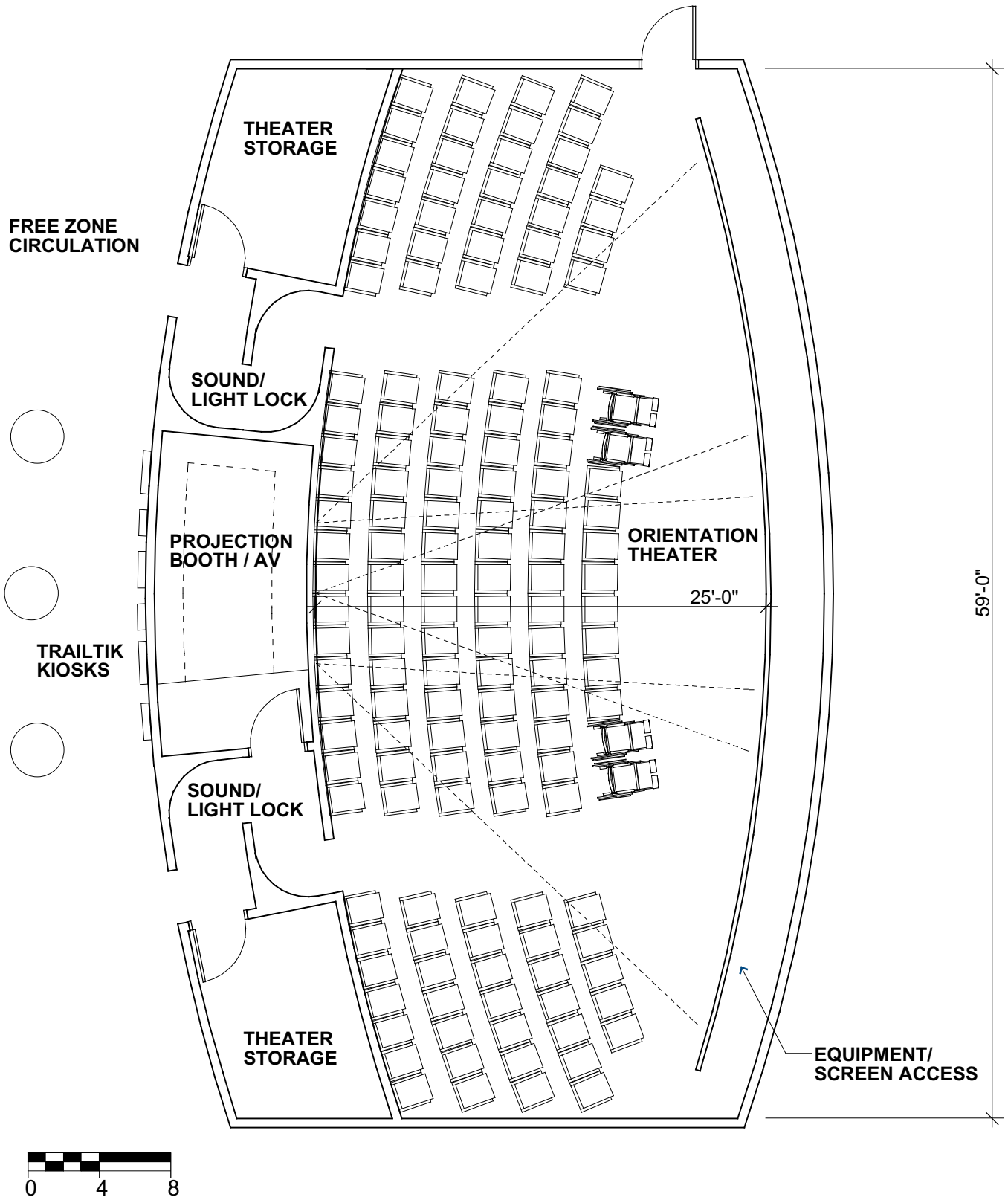
Phone/Data: Extensive A/V and IT equipment requiring special design consideration.

Other:

Furnishings and Equipment: Continuous equipment counter at projection port. Verify A/V and IT equipment list with Museum to completion of design. Trailtik kiosks can use room for their support equipment, to be verified during design.

Notes: Raise projection floor and port above audience chamber floor level to allow projection above audience heads. Trailtik kiosks should be located in circulation path on Lobby adjacent to projection booth.

Prototype Plan:



Notes:

2.4.3 Theater Storage

5.3.2 Public Program Spaces

Description

Function: Storage room(s) for miscellaneous Theater items (removable HC seats, extra seat parts, ticket stanchions, stage furniture, A/V equipment, etc..)

Capacity: ---

Net Area: 200 nsf.

Adjacency/Access

Adjacent to: Other Theater spaces, Lobby.

Access to: Loading Dock (or Freight Elevator).

Design Criteria

Architectural

Character: Utility.

Openings: 3' access door.

Ceiling Height/Materials: 10' high / Acoustic ceiling tile.

Walls: Durable surfaces.

Floors: Seamless resilient flooring.

Other: Solid surface counters.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Utility grade fluorescent.

Power: 120 v. convenience outlets.

Plumbing: N/A

Security: Low Security (see Electrical Section 4.3.6).

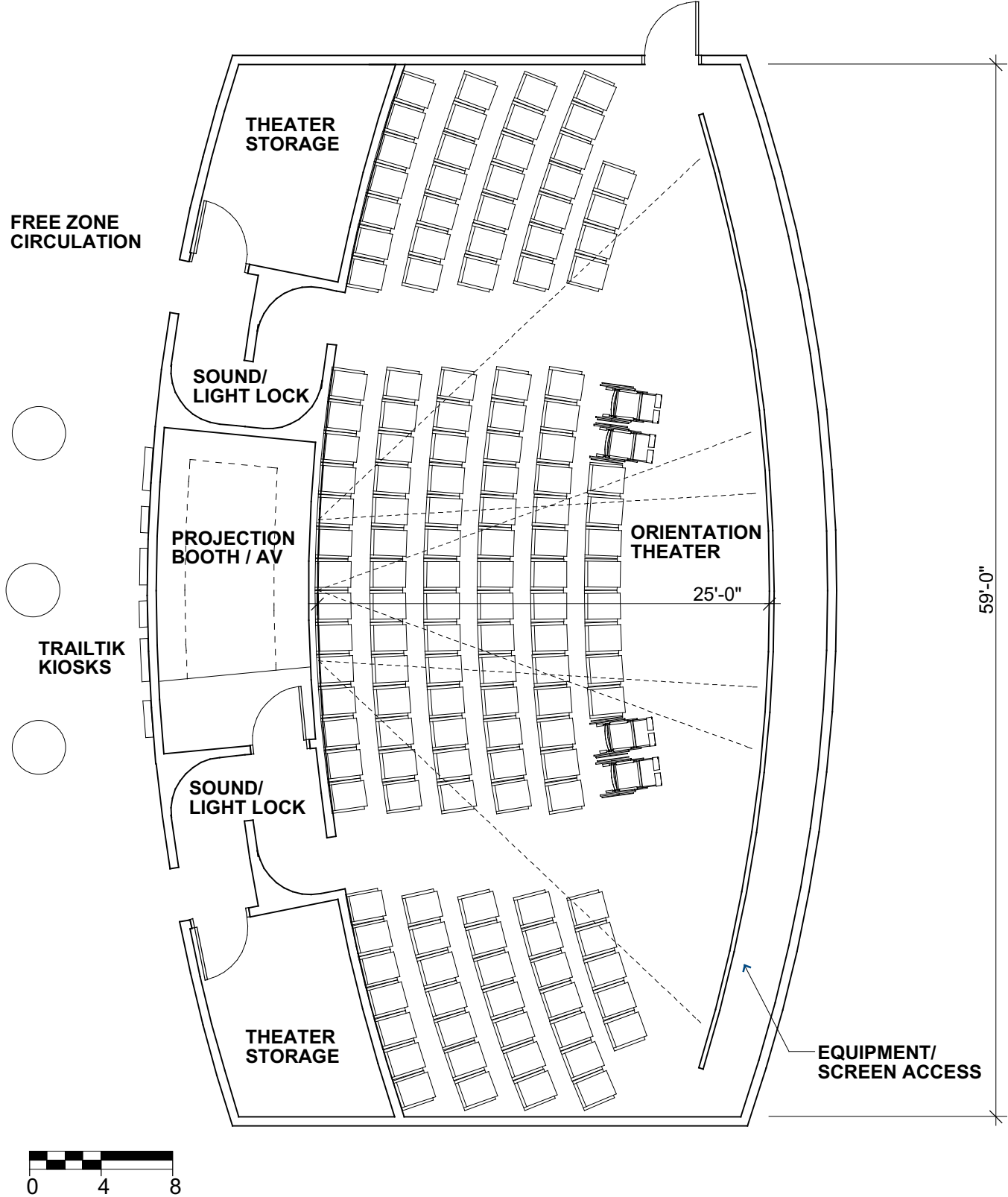
Phone/Data: N/A.

Other:

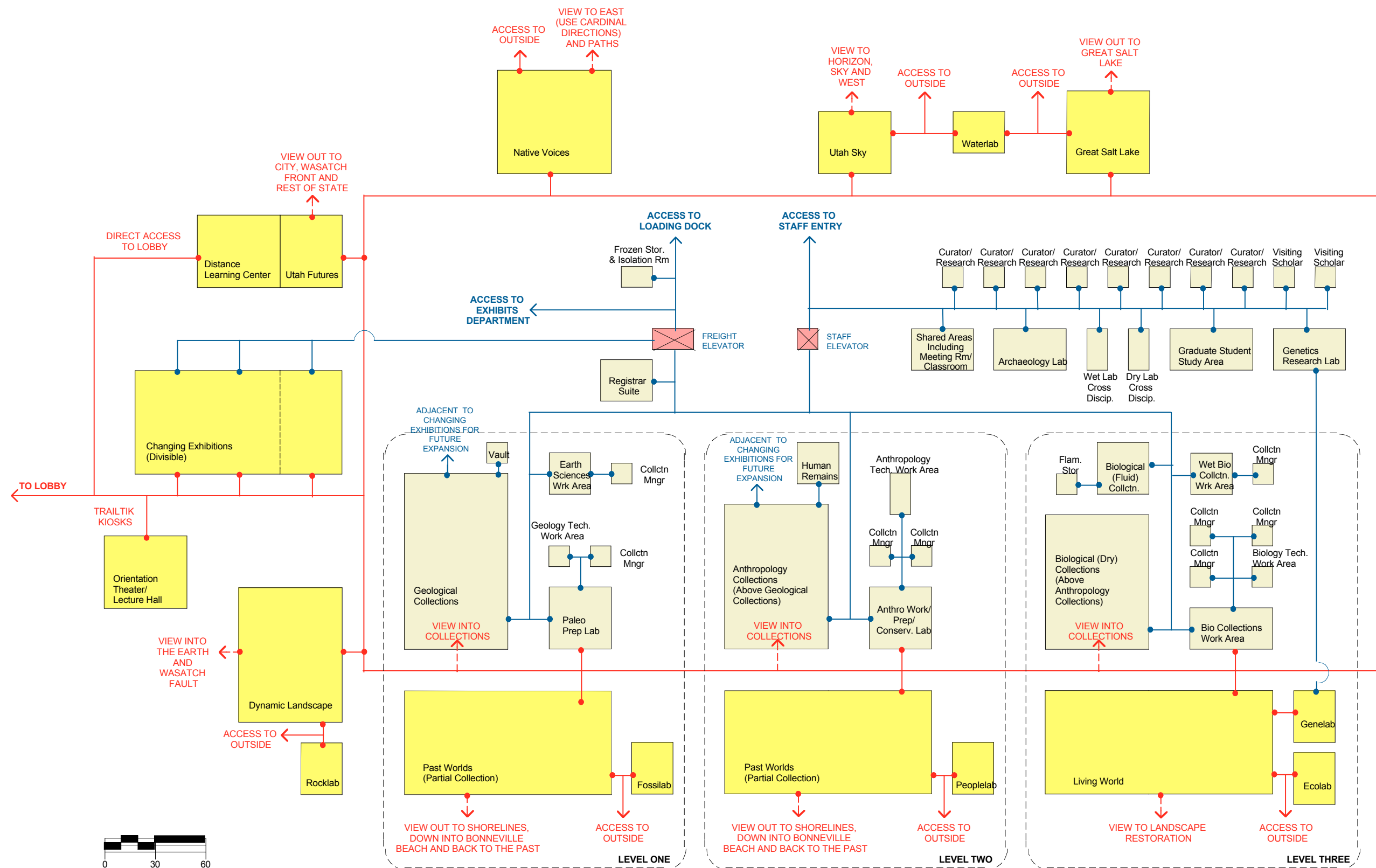
Furnishings and Equipment: Storage shelving as needed.

Notes: Can be divided into two 100 nsf rooms.

Prototype Plan:

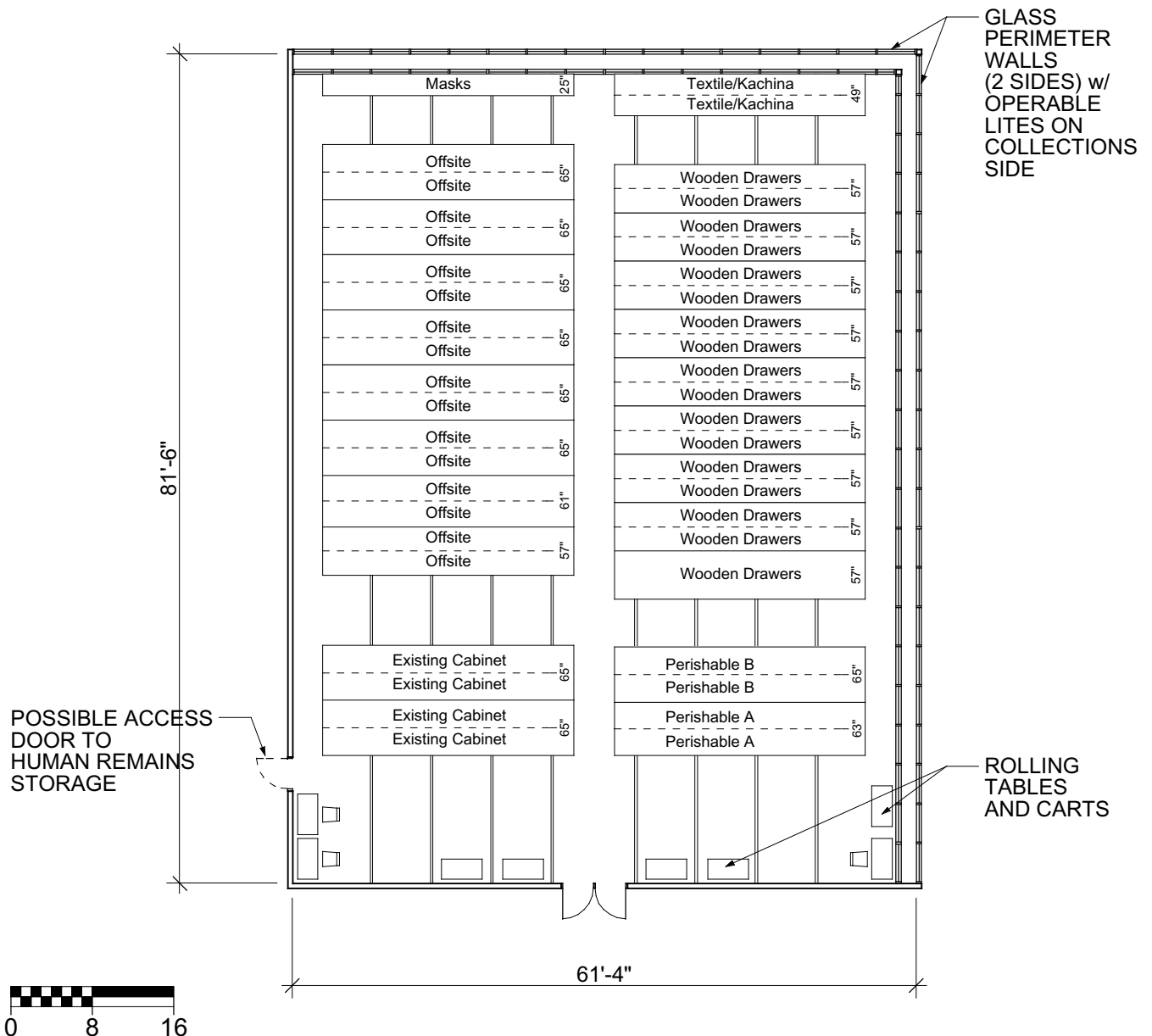


Notes:



Description	Function: Artifact storage for anthropological and archaeological collections. Capacity: Approximately 42 mobile ranges of collection storage cabinets (when fully compacted.) Net Area: 5000 nsf.
Adjacency/Access	Adjacent to: Core Circulation, Past Worlds Observatory, Anthropology Work/Prep/Conservation Lab, Isolation Room. Access to: Human Remains Storage, Anthropology Curator, Peoplelab, Loading Dock (or Freight Elevator), Registrar, Archaeology Lab, Technician Work Area.
Design Criteria	
Architectural	Character: Architectural “treasure box” (refer to Interpretive Plan for additional criteria). Openings: Automatic door, double 3’ doors with removable mullion (6’ wide x 8’ high minimum). Doubled perimeter glass walls on two sides (facing public spaces) with 18-20 inch deep internal display capability including operable lights (accessible from inside the collections areas), including seals for dust free environment, integral climate controls, fiber optic lighting and adjustable modular shelving. Ceiling Height/Materials: 12-15 feet high / White painted gypsum board or exposed structure (for indirect lighting). Walls: Glass, painted gypsum board. Floors: Seamless resilient flooring. Other: Sides visible from public circulation to have special graphic treatment on glass, spandrels, and soffits.
Systems	Structural: Building Standard (see Structural Section 4.3.2). 300 psf floor loading. Forklift loads. Compaction shelving with integral floor rails. Mechanical: Environment B.1 (see Mechanical Section 4.3.3). Lighting: Indirect fluorescent uplights parallel with occupant sensors to compaction floor rails. Feature lighting with visitor occupancy sensor at glass walls and supplemental on storage. Power: 120 v. convenience outlets. Power to automatic door. Plumbing: No overhead pressurized water or waste piping. Security: High security (see Electrical Section 4.3.6.). Phone/Data: Minimum of two network connections. Wireless network access. Other: Pre-action Sprinkler System. No clean outs or equipment access above.
Furnishings and Equipment	Mechanical compaction shelving on mobile carriages. Rolling carts for drawers and object transport. Two moveable computer tables, two adjustable armless rolling chairs, one standing rolling table with work surface.
Notes	Compaction shelving carriages may not all be installed initially. Initial installation to include floor rails, shelving units, and some carriages by Museum. Compaction shelving or cabinets may be faced with murals or other artwork.

Prototype Plan:



Notes: These collections are likely to expand over the Museum's lifetime. Internal expansion will be possible by adding more cabinets on mobile carriages. When that capacity is reached, additional space can be achieved by expanding into the upper level of the Changing Exhibitions gallery (see 2.2.1 and 2.2.2).

3.1.1.2 Human Remains Storage

5.3.3 Research and Collections

Description

Function: Collection storage for the human remains portion of the anthropology collection.

Capacity: --

Net Area: 530 nsf.

Adjacency/Access

Adjacent to: Anthropology Collection Storage.

Access to: Anthropology Collection Manager, Anthropology Prep/Conservation Lab.

Design Criteria

Architectural

Character: Two faces: elegant, orderly storage and dignified, comfortable viewing area.

Openings: Single secure 3' door.

Ceiling Height/Materials: 8-10 feet high / Painted gypsum board.

Walls: Painted gypsum board. Viewing area: textured walls.

Floors: Seamless resilient flooring. Viewing area: carpet.

Other:

Systems

Structural: Building Standard (see Structural Section 4.3.2). 150 psf floor loading.

Mechanical: Environment B.1 (see Mechanical Section 4.3.3).

Lighting: Indirect with occupancy sensors fluorescent in storage. Dimmable incandescent with occupancy sensors in viewing area.

Power: 120 v. convenience outlets.

Plumbing: No overhead pressurized water or waste piping.

Security: High Security (see Electrical Section 4.3.6).

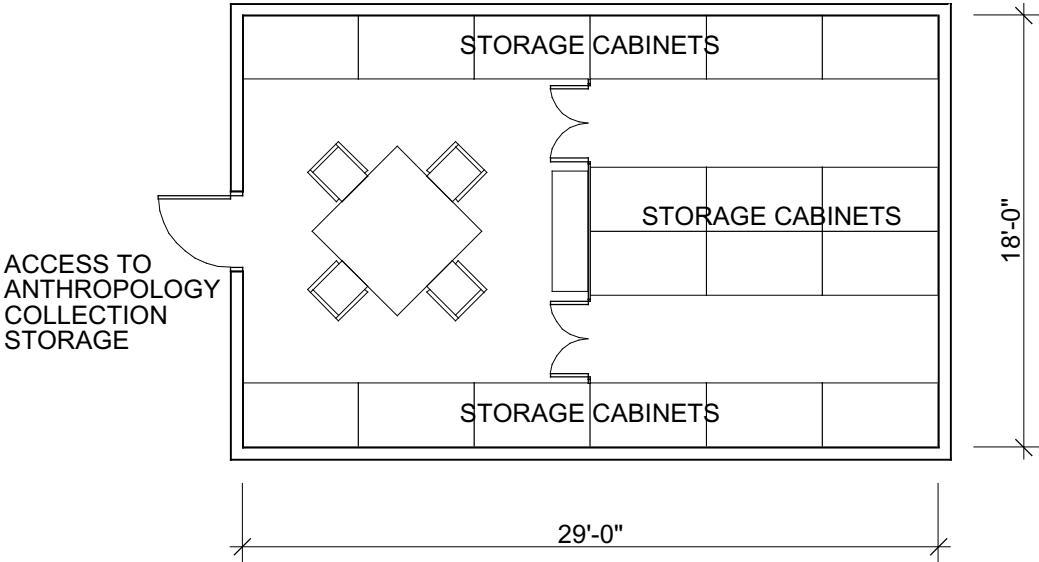
Phone/Data: Minimum of two network connections. Wireless network access.

Other: Pre-action Sprinkler System. No clean outs or equipment access above.

Furnishings and Equipment: Lockable security cabinets with wood end panels. Wooden table and chairs. Built-in credenza/counter with cabinets below.

Notes: The remains in this collection are believed to be of Native Americans. The remains are periodically visited by Native Americans as part of respectful belief rituals. The architectural character of the space should reflect this.

Prototype Plan:



Notes:

3.1.2.1 Earth Sciences Collections Storage

5.3.3 Research and Collections

Description

Function: Ecofact storage for paleontological and mineralogical collections.

Capacity: Approximately 12 mobile ranges of storage cabinets and 16 mobile ranges of pallet racks (when fully compacted).

Net Area: 6200 nsf.

Adjacency/Access

Adjacent to: Paleontology Prep Lab, Dynamic Landscape and Past Worlds Observatories, Vault, Core Circulation, Geology Clean Work Area, Isolation Room

Access to: Paleontology Curator, Collection Manager, Dynamic Landscape and Past Worlds Observatories, Technician Work Area, Rock Lab, Fossil Lab, Registrar, Loading Dock (or Freight Elevator).

Design Criteria

Architectural

Character: Architectural “treasure box” (refer to Interpretive Plan for additional criteria).

Openings: Double 3' doors with removable mullion (6' wide x 8' high minimum). Doubled perimeter glass walls on two sides (facing public spaces) with 18-20 inch deep internal display capability including operable lights (accessible from inside the collections areas), including seals for dust free environment, integral climate controls, fiber optic lighting and adjustable modular shelving.

Ceiling Height/Materials: 12-15 feet high / White painted gypsum board or exposed structure (for indirect lighting).

Walls: Glass, painted gypsum board.

Floors: Seamless resilient flooring.

Other: Sides visible from public circulation to have special graphic treatment on glass, spandrels, and soffits. 4' deep built-in counters along one wall.

Systems

Structural: Building Standard (see Structural Section 4.3.2). 300 psf floor loading. Fork lift loads. Compaction shelving with integral floor rails.

Mechanical: Environment B.2 (see Mechanical Section 4.3.3).

Lighting: Indirect fluorescent uplights with occupant sensors parallel to compaction floor rails. Feature lighting with visitor occupancy sensors. at glass walls and supplemental storage.

Power: 120 v. convenience outlets.

Plumbing: No overhead pressurized water or waste piping.

Security: High Security (see Electrical Section 4.3.6).

Phone/Data: Minimum of two network connections.

Other: Pre-action Sprinkler System. No clean outs or equipment access above.

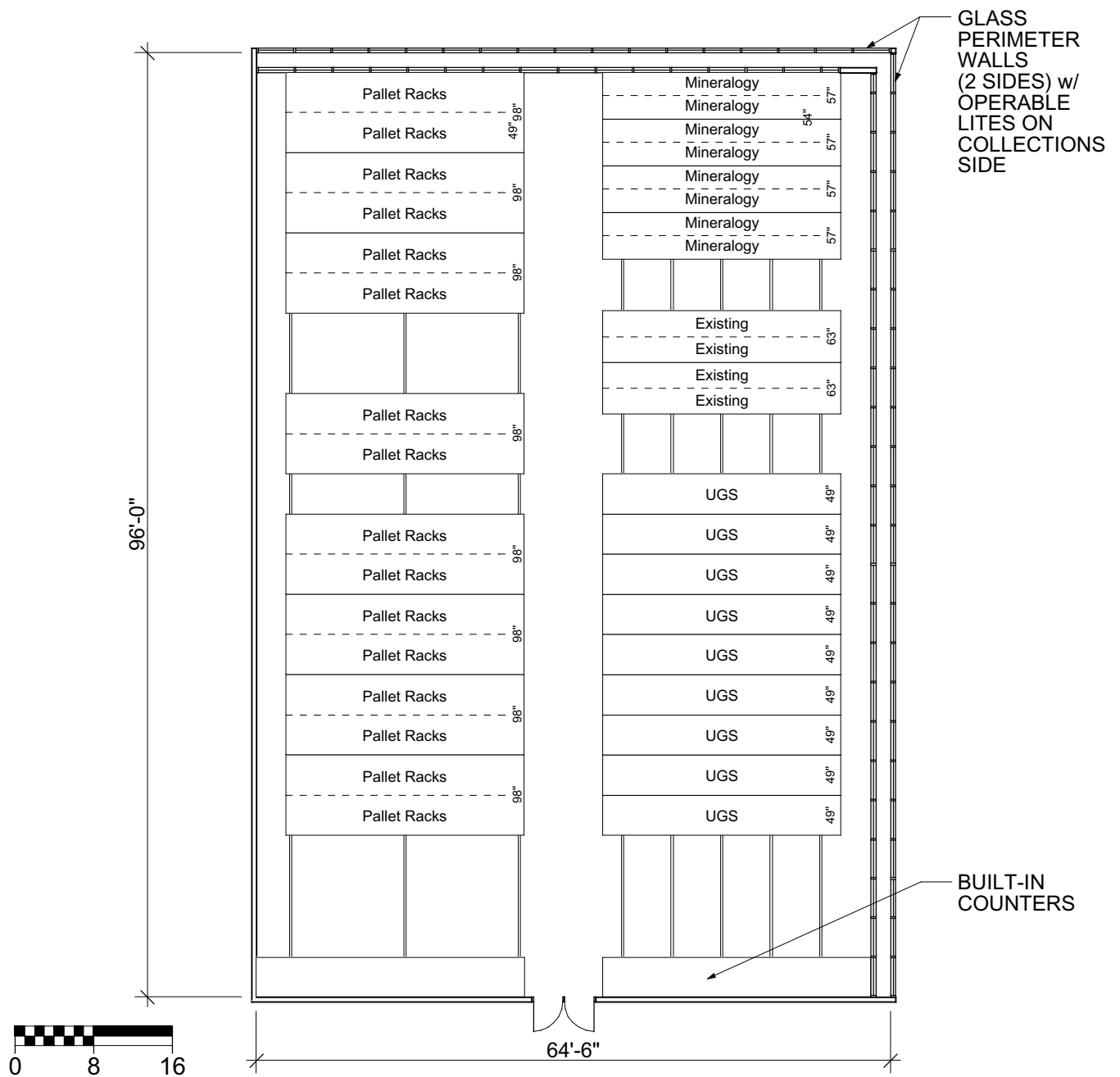
Furnishings and Equipment: Mechanical compaction shelving on mobile carriages. Rolling carts for object transport.

5.3.3 Research and Collections

3.1.2.1 Earth Sciences Collections Storage

Notes: Compaction shelving carriages may not all be installed initially. Initial installation to include floor rails, shelving units, and carriage by Museum. Compaction shelving may be faced with murals or other artwork.

Prototype Plan:



Notes: These collections are likely to expand over the Museum's lifetime. Internal expansion will be possible by adding more cabinets on mobile carriages. When that capacity is reached, additional space can be achieved by expanding into the Changing Exhibitions gallery (see 2.2.1 and 2.2.2).

3.1.2.2 Vault

5.3.3 Research and Collections

Description

Function: Storage of high value items (primarily from Mineralogy collection and paleontology types.)

Capacity: --

Net Area: 100 nsf.

Adjacency/Access

Adjacent to: Geological Collection Storage Area.

Access to: Mineralogy Curator, Collection Manager, Earth Science Work Area, Registrar, Loading Dock
(and Freight Elevator.)

Design Criteria

Architectural

Character: Unobtrusive, secure, efficient.

Openings: Single, secure 3' access door on one side.

Ceiling Height/Materials: 10 feet high / Painted gypsum board or exposed structure.

Walls: Painted gypsum board over concrete block..

Floors: Seamless resilient flooring.

Other:

Systems

Structural: Building Standard (see Structural Section 4.3.2). 300 psf floor loading.

Mechanical: Environment B.2 (see Mechanical Section 4.3.3).

Lighting: Color-corrected indirect fluorescent up lights with occupant sensors.

Power: 120 v. convenience outlets.

Plumbing: No overhead pressurized water or waste piping.

Security: High Security (see Electrical Section 4.3.6).

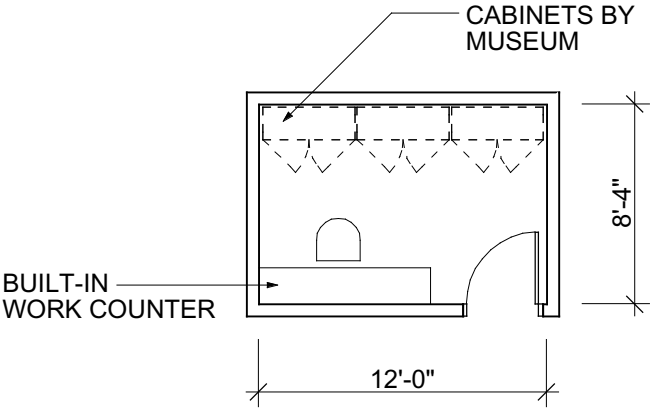
Data/Phone: Minimum of one network connection.

Other: Pre-action Sprinkler System. No clean outs or equipment access above.

Furnishings and Equipment: Fixed security cabinets by Museum. Built in examination counter with task lighting.

Notes:

Prototype Plan:



Notes:

3.1.3.1 Biological (dry) Collections Storage

5.3.3 Research and Collections

Description

Function: Ecofact storage for entomology, malacology, herbarium, birds and mammals, and turtles.

Capacity: 33 mobile ranges of collection storage cabinets (partially compacted.)

Net Area: 4700 nsf.

Adjacency/Access

Adjacent to: BioCollection Work Area, Core Circulation, Living World Observatory, Biological Fluid Collections, Isolation Room.

Access to: Biology Collections Curators, Collection Managers, Genelab, Ecolab, Registrar, Technician Work Areas, Loading Dock (or Freight Elevator).

Design Criteria

Architectural

Character: Architectural "treasure box" (refer to Interpretive Plan for additional criteria).

Openings: Double 3' doors with removable mullion (6' wide x 8' high minimum). Doubled perimeter glass walls on two sides (facing public spaces) with 18-20 inch deep internal display capability including operable lights (accessible from inside the collections areas), including seals for dust free environment, integral climate controls, fiber optic lighting and adjustable modular shelving.

Ceiling Height/Materials: 12-15 feet high / White painted gypsum board or exposed structure (for indirect lighting).

Walls: Glass, painted gypsum board.

Floors: Seamless resilient flooring.

Other: Sides visible from public circulation to have special graphic treatment on glass, spandrels, and soffits.

Systems

Structural: Building Standard (see Structural Section 4.3.2). 300 psf floor loading. Compaction shelving with integral floor rails.

Mechanical: Environment B.3 (see Mechanical Section 4.3.3).

Lighting: Indirect fluorescent uplights with occupant sensors parallel to compaction floor rails. Feature lighting with visitor occupancy sensors at glass walls and supplemental storage.

Power: 120 v. convenience outlets.

Plumbing: No overhead pressurized water or waste piping.

Security: High Security (see Electrical Section 4.3.6).

Phone/Data: Minimum of two network connections.

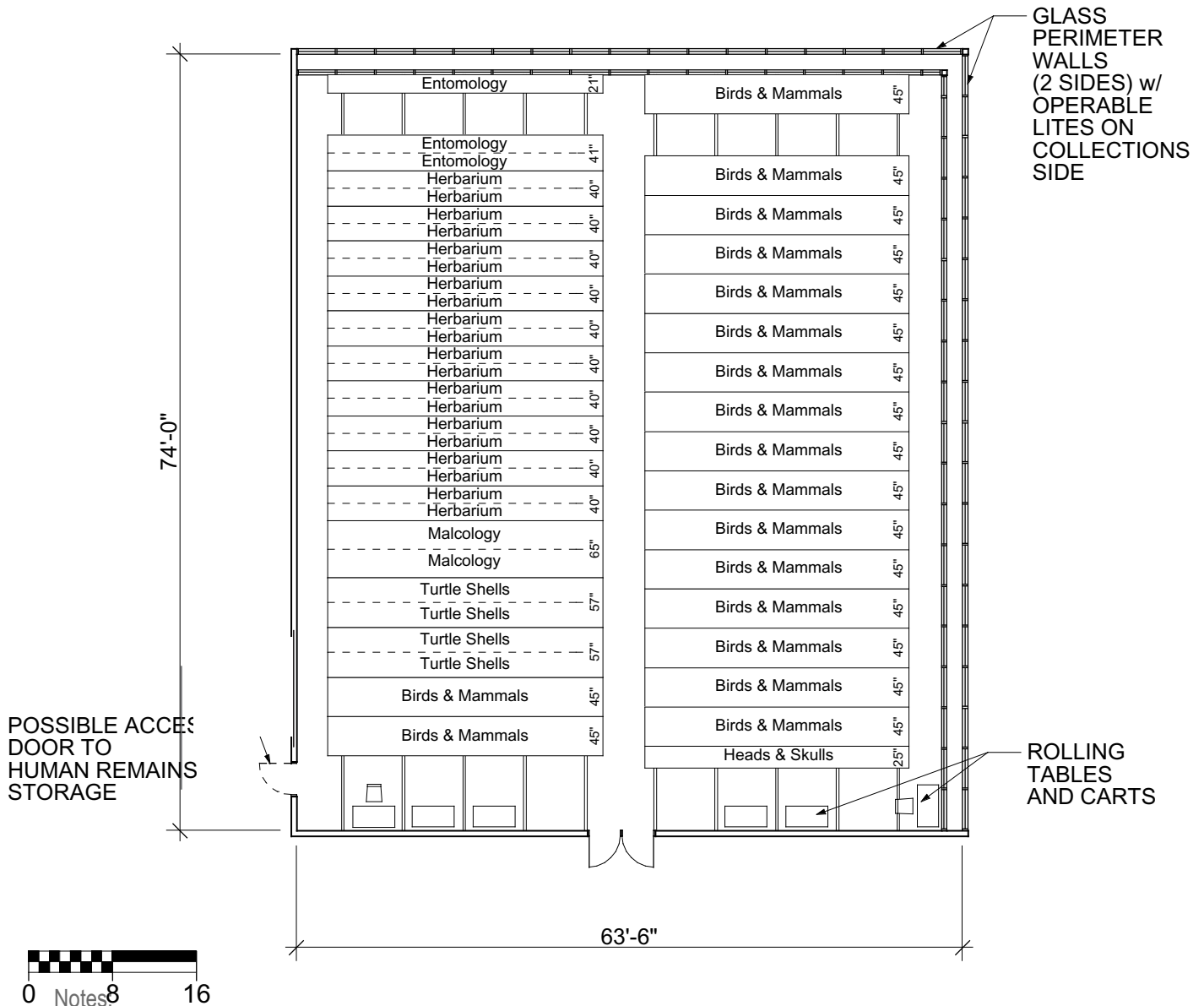
Other: Pre-action Sprinkler System. No clean outs or equipment access above.

Furnishings and Equipment: Mechanical compaction shelving on mobile carriages. Rolling carts for object transport. Standing height moveable work counter, two rolling computer desks, two rolling adjustable armless chairs.

3.1.3.1 Biological (dry) Collections Storage

Notes: Compaction shelving carriages may not all be installed initially. Initial installation to include floor rails, shelving units, and carriage by Museum. Compaction shelving may be faced with murals or other artwork.

Prototype Plan:



3.1.4.1 Biological (fluid) Collections Storage

5.3.3 Research and Collections

Description

Function: Storage for biological collections preserved in fluid filled vessels.

Capacity: --

Net Area: 895 nsf.

Adjacency/Access

Adjacent to: Flammable Storage, Biological Dry Collections, Wet Biology Collection Work Area.

Access to: Curator, Loading Dock (or Freight Elevator), Collection Manager, Technician Work Area,

Cross Disciplinary Wet Lab, Registrar, emergency eye-wash and shower station.

Design Criteria

Character: Unobtrusive, secure, efficient.

Openings: Single, secure 3' access door on one side.

Ceiling Height/Materials: 12-15 feet high / Painted gypsum board or exposed structure.

Walls: Painted gypsum board over concrete block.

Floors: Seamless resilient flooring.

Other: Fire separation construction from other spaces.

Systems

Structural: Building Standard (see Structural Section 4.3.2). 300 psf floor loading. Compaction shelving with integral floor rails.

Mechanical: Environment F (see Mechanical Section 4.3.3).

Lighting: Color-corrected indirect fluorescent up lights with occupant sensors.

Power: 120 v. convenience outlets.

Plumbing: No overhead pressurized water or waste piping. Floor drain.

Security: High Security (see Electrical Section 4.3.6).

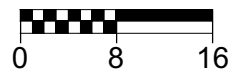
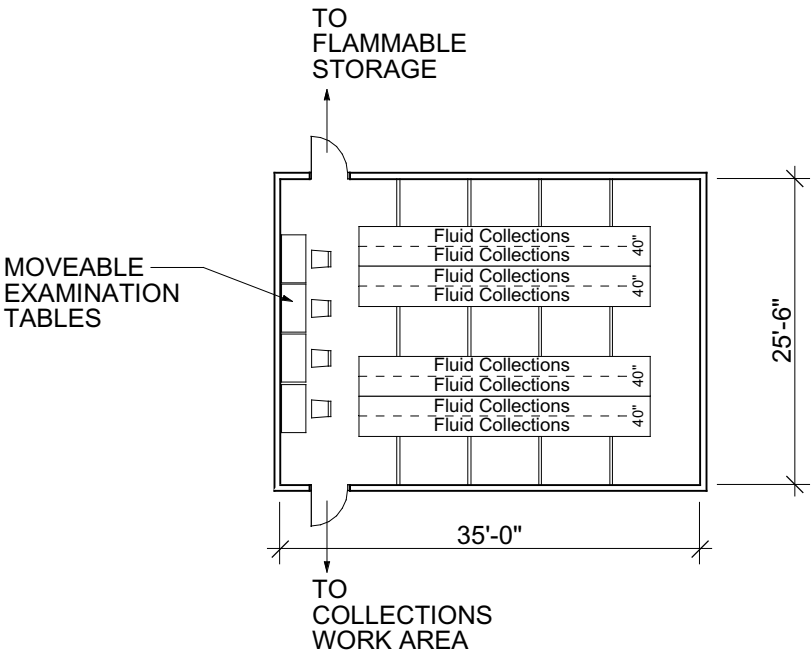
Phone/Data: Minimum of two network connections.

Other: Gas Suppression System - Inergen. No clean outs or equipment access above.

Furnishings and Equipment: Mechanical compacting shelving on mobile carriages. Moveable examination tables.

Notes: This room contains flammable liquids in sealed containers. Verify fire separation requirements during design phase.

Prototype Plan:



Notes: Storage capacity of this space must be verified during the design phase.

3.1.4.2 Biological (fluid) Flammable Storage

5.3.3 Research and Collections

Description

Function: Storage for fluids used in fluid-preserved biological collections (95% ethanol (ethyl alcohol) formaldehyde).

Capacity: --

Net Area: 75 nsf.

Adjacency/Access

Adjacent to: Biological (fluid) Collections.

Access to: Wet Biological Collections Work Area, Biological Collections Work Area, Curator, Loading Dock, Cross-Disciplinary Wet Lab, Registrar, emergency eyewash and shower station.

Design Criteria

Character: Unobtrusive, secure, efficient.

Openings: Single, secure 3' access door on one side.

Ceiling Height/Materials: 12-15 feet high / Painted gypsum board or exposed structure.

Walls: Painted gypsum board over concrete block.

Floors: Seamless resilient flooring.

Other: Fire separation construction from other spaces.

Systems

Structural: Building Standard (see Structural Section 4.3.2). 150 psf floor loading.

Mechanical: Environment F (see Mechanical Section 4.3.3).

Lighting: Color-corrected indirect fluorescent up lights with occupant sensors.

Power: N/A.

Plumbing: No pressurized overhead water or waste piping.

Security: High Security (see Electrical Section 4.3.6).

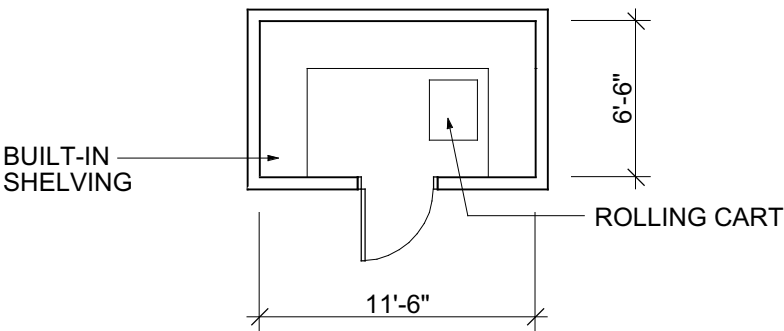
Phone/Data: Minimum of two network connections.

Other: Gas Suppression System - Inergen. No clean outs or equipment access above.

Furnishings and Equipment: Fixed Shelving by Museum. Rolling cart for transporting liquids.

Notes: This room contains flammable liquids in sealed containers. Verify fire separation requirements during design phase.

Prototype Plan:



Notes:

3.1.5 Frozen Storage / Isolation Room

5.3.3 Research and Collections

Description

Function: Room shared between departments for cryo fumigation, deep freeze storage and refrigerated storage of various collection items.

Capacity: --

Net Area: 200 nsf.

Adjacency/Access

Adjacent to: Loading Dock.

Access to: Freight Elevator, Collections and Research Areas.

Design Criteria

Architectural

Character: Clean, efficient, orderly.

Openings: Double 3' doors to service corridor (6' wide minimum).

Ceiling Height/Materials: 10' high, open structure

Walls: Epoxy painted gypsum board or concrete block walls.

Floors: Seamless resilient flooring.

Other: Solid surface work counter with cabinets above and below.

Systems

Structural: Building Standard (see Structural Section 4.3.2). 150 psf floor loading.

Mechanical: Environment B.2, extra cooling to equipment to be reviewed during design phase (see Mechanical Section 4.3.3).

Lighting: Indirect fluorescent with occupant sensors.

Power: 220 v./20 amp and 120 v./20 amp, review with final equipment during the design phase. Must be directly connected to emergency power supply.

Plumbing: Condensate drains. Work sink.

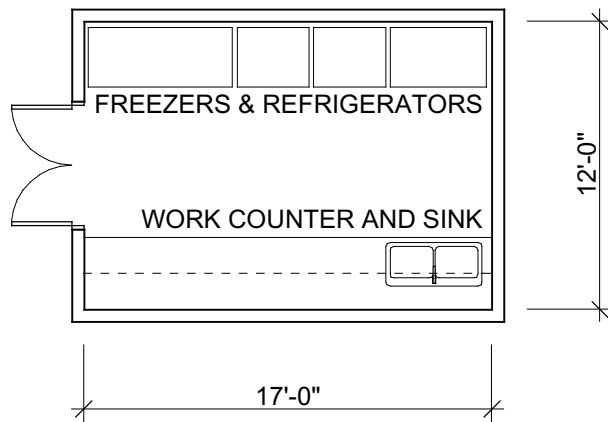
Security: Medium Security (see Electrical Section 4.3.6).

Phone/Data: N/A.

Other: Pre-action Sprinkler System.

Furnishings and Equipment: Three chest freezers (one each for biology, paleontology, and anthropology) and one ultra-cold chest freezer. Verify final equipment list with Museum during design phase.

Prototype Plan:



Notes: Use of anoxic pest control treatments should be reviewed during the design phase. This may require a carbon dioxide chamber with a direct outside exhaust to vent the gas used (via controlled hose system). This is experimental technology that should be considered during design.

Recommendation: Many museums are now looking at anoxic pest control treatments because freezer units can be size constraining, in addition to the more important fact that freezing is not a universal solution; not all organics can be frozen due to the strain and stress that would be inflicted on the artifact. Through the use of anoxic treatments (nitrogen gas, carbon dioxide gas, “ageless” oxygen scavengers, etc.) most, if not all, collections within this museum can safely be treated for potential or actual pest infestation. Although this is a relatively new field in the care of museum collections, the Getty Conservation Institute (*The Use of Oxygen-Free Environments in the Control of Museum Insect Pests 2003*) performed extensive testing of various anoxic treatments confirming its viability.

A carbon dioxide chamber is used by the Oklahoma Museum of Natural History, which is approximately 12 ft x 12 ft x 12 ft, constructed of a durable, malleable material. They are able to bring in large mounts, multiple cabinets (doors opened), field collections, etc., for treatment prior to these objects entering the gallery or collections room, or to treat a pervious infestation (usually localized in a single cabinet). The isolation room would require a direct outside exhaust to vent the gas used (via controlled hose system).

3.2.1 Anthropology Work/Prep/ Conservation Lab Area

5.3.3 Research and Collections

Description

Function: Non-public lab (visually open to Past Worlds exhibit gallery) for research, work, prep and conservation related to anthropology.

Capacity: 19 people.

Net Area: 1200 nsf.

Adjacency/Access

Adjacent to: Past Worlds Observatory, Anthropological Collections, Anthro Collections Technician Work Area and two Collection Manager Offices.

Access to: Research/Curator Offices & Labs, Registrar.

Design Criteria

Architectural

Character: Clean, functional, state-of-the-art lab.

Openings: Large, above counter glass windows to exhibit gallery. Lab partially visible. Soundproof glass.

Double 3' doors with removeable mullion (6' high x 8' high minimum).

Ceiling Height/Materials: 12' height / Acoustical ceiling tile (2x2) with dropped gypsum board soffits.

Walls: Painted gypsum board.

Floors: Seamless resilient flooring.

Other: Built-in solid surface (lab-top) counters with wall cabinets / open shelves above and lockable cabinets / drawers below. One built-in fume hood with stainless steel ducting. One flammable cabinet with exhaust.

Systems

Structural: Building Standard (see Structural Section 4.3.2). 150 psf floor loading.

Mechanical: Environment C (see Mechanical Section 4.3.3).

Lighting: Indirect ambient above cabinets with occupant sensors, direct tasklighting, under-cabinet lighting (separately switched).

Power: Electric outlet strips above counter and outlets at 10' oc along walls. Three 110 v. flush floor outlets or ceiling drop power (review during design phase).

Plumbing: Deep, stainless steel lab double-sink. Chemicals will possibly escape into drain; special attention should be made for drains and sediment traps.

Security: Medium Security (see Electrical Section 4.3.6).

Phone/Data: Telephone and network connections. Wireless internet.

Other: Two built-in vacuums overhead (Nederman Trunks). Exhaust for flammable cabinet and fume hood. Pre-action Sprinkler System.

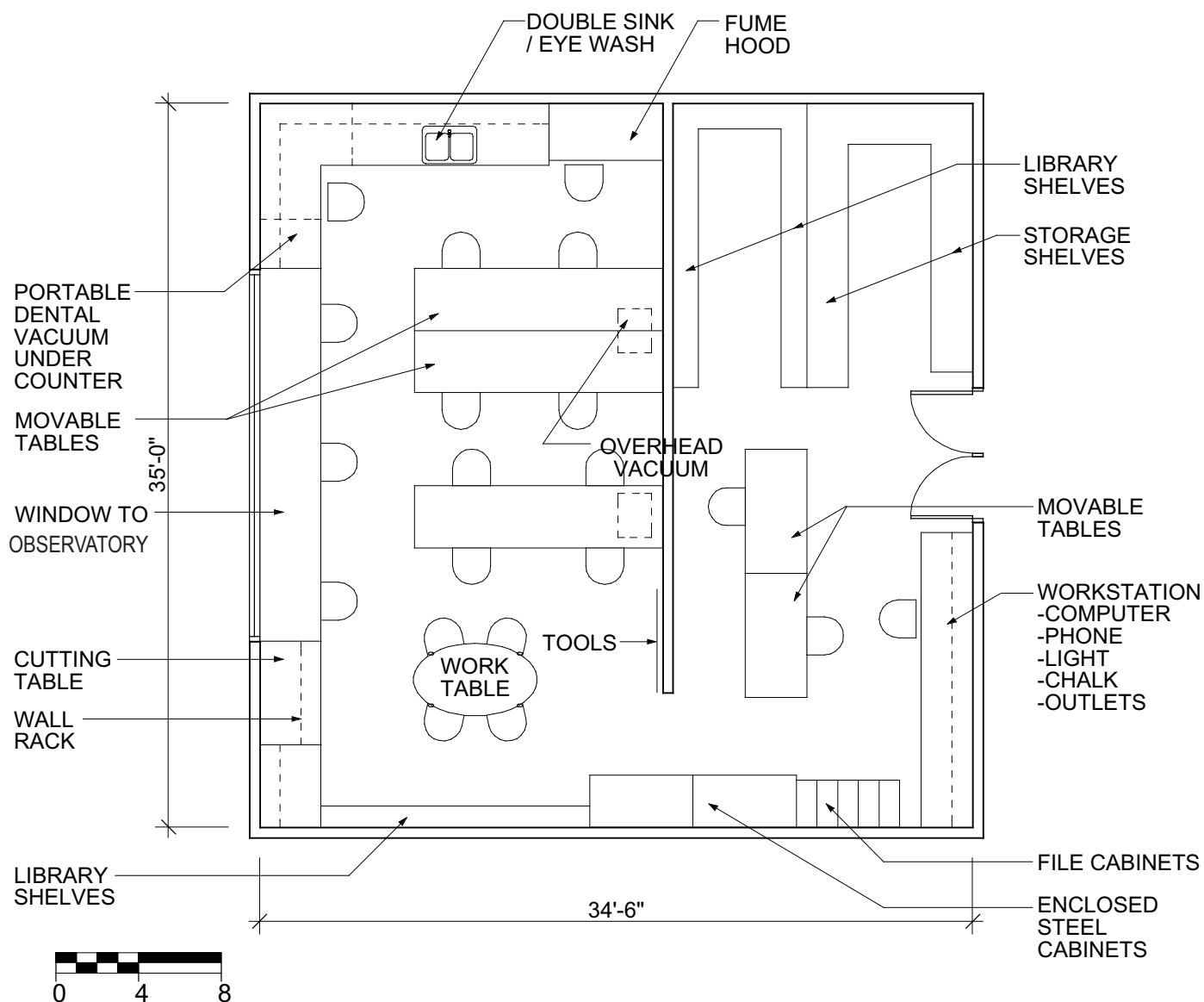
5.3.3 Research and Collections

3.2.1 Anthropology Work/Prep/Conservation Lab Area

Furnishings and Equipment: Three 3'x12' and two 3'x6' adjustable height tables (lab-type surface) with casters; tables should be able to "lock" together. One oval table for four. 19 armless chairs. All work stations have a computer, phone, outlet and tasklight. Five 2'x1' fire-proof locking file cabinets. Two 5' (30" deep) steel work cabinets. Two rows of 13'x2' storage shelving. Library shelving (three 1'x13', one 1'x3'). One 5'x2' wall rack with adjustable brackets for rods (that slip through rolled supplies). One 5'x3' cutting table with wall mounted board with hooks for various tools. Desktop computers and monitors. Safety equipment as required (including first aid and eye wash). Shades for windows.

Notes: Double sink should have work counter space on both sides of it. At work stations there should be open areas on both sides of chair where custom sized baker racks can slide in and out for current work on objects on one side and a two drawer file on the other side.

Prototype Plan:



Notes:

3.2.2 Earth Sciences Work Area

5.3.3 Research and Collections

Description

Function: Non-public lab for research, work, prep, and conservation related to geological collections.

Capacity: 7 people.

Net Area: 600 nsf.

Adjacency/Access

Adjacent to: Paleontology Prep Lab, Geological Collections.

Access to: Research/Curator Offices and Labs, Collection Manager Office, Registrar.

Design Criteria

Architectural

Character: Clean, functional, state-of-the art lab.

Openings: Double 3' door.

Ceiling Height/Materials: 12' height / Acoustical ceiling tile (2 x 2) with dropped gypsum board soffits.

Walls: Painted gypsum board.

Floors: Seamless resilient flooring.

Other: Built-in solid surface (lab-top) counter with wall cabinets, open shelves above. Chemical storage cabinet with ventilation.

Systems

Structural: Building Standard (see Structural Section 4.3.2). 150 psf floor loading. Forklift loads.

Mechanical: Environment C with make-up air (see Mechanical Section 4.3.3).

Lighting: Indirect ambient with occupant sensors, direct task lighting, under cabinet lighting.

Power: Power for fume hood. Electric outlet strip above counter. Outlets at 10' o.c. along walls. 220 v. at equipment area for x-ray diffraction.

Plumbing: Shower, one large and one double stainless steel sink with sediment trap (and hose attachment).

Security: Medium Security (see Electrical Section 4.3.6).

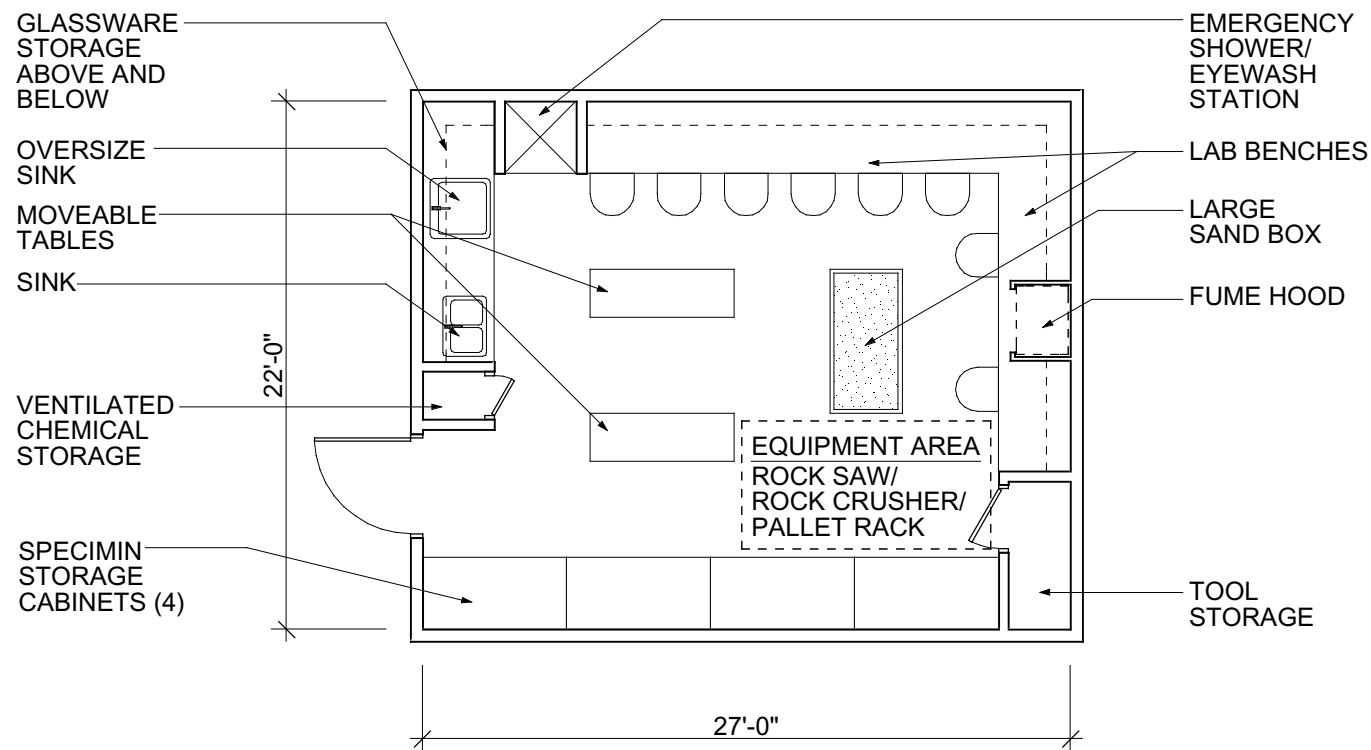
Phone/Data: Telephone and network connections. Wireless internet.

Other: Exhaust for fume hood. Ventilation for chemical storage cabinet. Minimum two gas and air outlets. Pre-action Sprinkler System.

Furnishings and Equipment: Two 2 x 6 lab tables on casters (capable of supporting blocks). Low and high temperature furnaces. Sandbox (6' x 3') on casters. Test tube/bottle drying rack. Pallet rack. Safety equipment as required (including eye-wash station, shower, fire blanket, first aid kit). One petrographic scope, a compound binocular scope, and two stereo-zoom binocular dissecting scopes (all with stands). Four 6 x 3' storage cabinets for specimens.

Notes: Coordinate door and opening widths to accommodate pallets and pallet jacks.

Prototype Plan:



Notes:

3.2.3 Paleontology Prep Lab

5.3.3 Research and Collections

Description

Function: Non-public lab (visually open to Past Worlds exhibit gallery) for research, work, prep and conservation related to paleontology.

Capacity: 30 people.

Net Area: 1200 nsf.

Adjacency/Access

Adjacent to: Past Worlds Observatory, Geological Collections, Geology Collections Technician Work Area and one Collection Manager Office.

Access to: Research/Curator Offices & Labs, Registrar.

Design Criteria

Architectural

Character: Clean, functional, state-of-the-art lab.

Openings: Above counter glass window to exhibit gallery. Sound proof glass. Double 3' doors with removeable mullion (6' wide x 8' high minimum).

Ceiling Height/Materials: 12' height / Acoustical ceiling tile (2x2) with dropped gypsum board soffits.

Walls: Painted gypsum board.

Floors: Seamless resilient flooring.

Other: Built-in solid surface (lab-top) counters with wall cabinets / open shelves above and lockable cabinets / drawers below. One hazardous chemical cabinet with exhaust. One air abrasion station with built-in cabinet and vacuum unit. Overhead lift/crane.

Systems

Structural: Building Standard (see Structural Section 4.3.2). 150 psf floor loading. Fork lift loads. Special structure for lift/crane support (two ton capacity).

Mechanical: Environment C with make-up air (see Mechanical Section 4.3.3).

Lighting: Indirect ambient above cabinets with occupant sensors, direct tasklighting, under-cabinet lighting (separately switched).

Power: Electric outlet strips above counter and outlets at 10' oc along walls. Two 110 v. flush floor outlets or ceiling drop power (review during design phase).

Plumbing: Deep, stainless steel lab double-sink. Chemicals will possibly escape into drain; special attention should be made for drains and sediment traps.

Security: Medium Security (see Electrical Section 4.3.6).

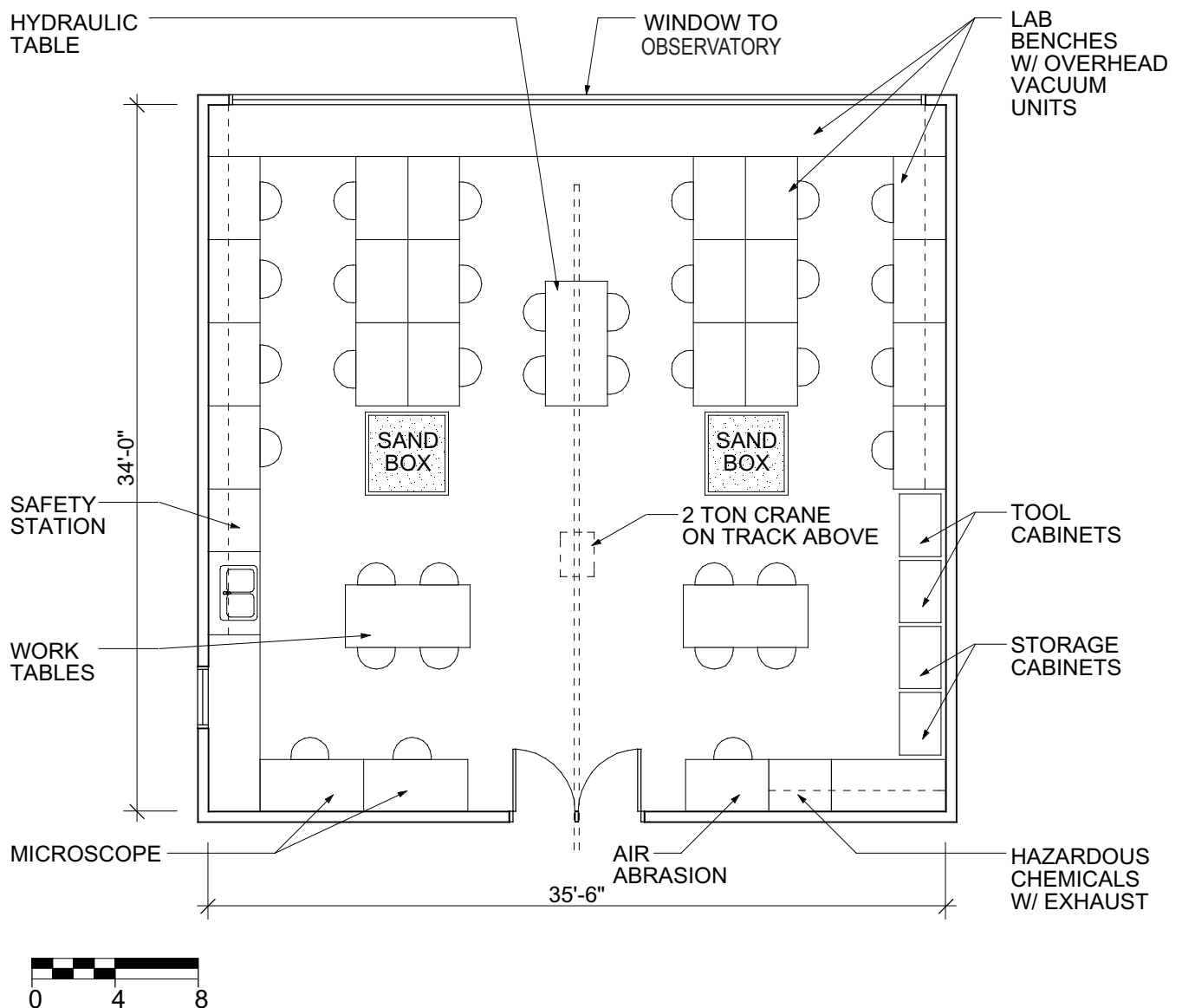
Phone/Data: Telephone and network connections. Wireless internet. Video feeds from microscope stations to projection screens in exhibit gallery.

Other: Exhaust for hazardous chemical cabinet. Overhead coarse dust removal vacuum units for each lab bench and general extractor fans for fine dust removal. Vacuum for air abrasion station. Pre-action Sprinkler System.

Furnishings and Equipment: Two 3'x6' adjustable height tables (lab-type surface). 30 stools. One 3'x6' hydraulic table. Two sand box tables on casters. Two large cabinets for tool storage. Cabinets for specimen storage. Two microscopes with video feeds to exhibit gallery. Desktop computers and monitors. Safety equipment as required. Shades for windows.

Notes: Vacuum requirements and equipment (i.e. location) to be reviewed during the design phase.

Prototype Plan:



Notes:

3.2.4 Biological Collections Work Area

5.3.3 Research and Collections

Description

Function: Non-public lab (part visually open to Living World exhibit gallery) for research, work, prep and conservation related to biology.

Capacity: 15 people.

Net Area: 1000 nsf.

Adjacency/Access

Adjacent to: Living World Observatory, Biological Collections, Biology Collections Technician Work Area and three Collection Manager Offices (Visiting Scholars).

Access to: Research/Curator Offices & Labs, Registrar.

Design Criteria

Architectural

Character: Clean, functional, state-of-the-art lab. Room divided by gypsum board wall.

Openings: Large, above counter glass windows to exhibit gallery with sound-proof glass. Two 4' doors.

Ceiling Height/Materials: 12' height / Acoustical tile (2x2) with dropped gypsum board soffits.

Walls: Painted gypsum board.

Floors: Seamless resilient flooring.

Other: Built-in solid surface (lab-top) counters with wall cabinets / open shelves above and lockable cabinets / drawers below. One built-in fume hood.

Systems

Structural: Building standard (see Structural Section 4.3.2).

Mechanical: Environment C with make-up air (see Mechanical Section 4.3.3).

Lighting: Indirect ambient above cabinets with occupant sensors, direct tasklighting, under-cabinet lighting (separately switched). All lights should be UV screened.

Power: Electric outlet strips above counter and below glass wall (120 v. and 220 v., 20 amps). Outlets at 10' oc along walls. Two 110 v. flush floor outlets or ceiling drop power (review during design phase). Power for equipment (i.e. refrigerators, freezers, ovens) should have back-up power and alarm.

Plumbing: Two deep, stainless steel lab sinks (one needs to also deliver deionized water). PVA glue and caustic chemicals will possibly escape into drain; special attention should be made for drains and sediment traps. Floor drain.

Security: Medium Security (see Electrical Section 4.3.6).

Phone/Data: Minimum five telephone and eleven network connections.

Other: Gas and vacuum lines in two locations. Exhaust for fume hood. Pre-action Sprinkler System.

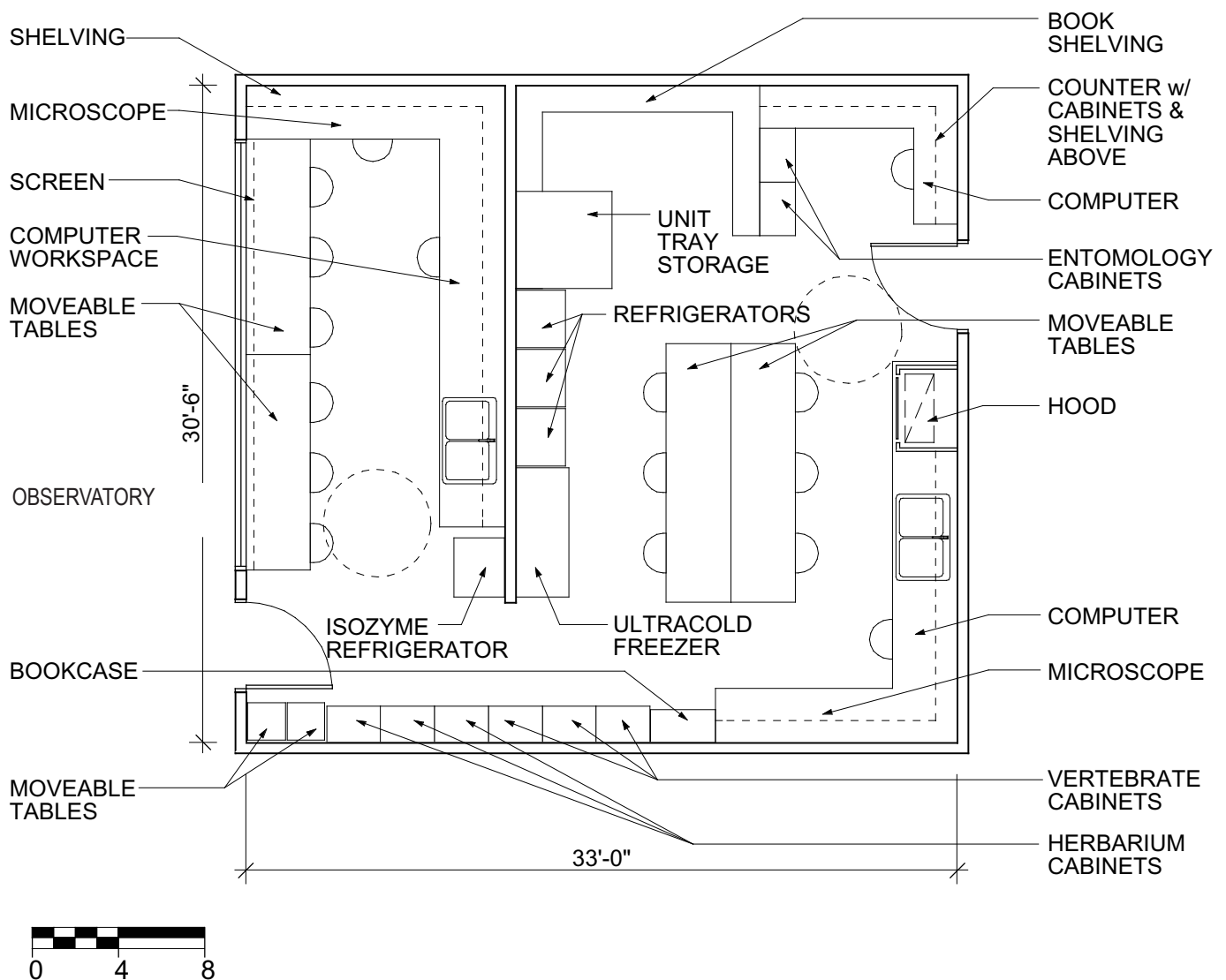
5.3.3 Research and Collections

3.2.4 Biological Collections Work Area

Furnishings and Equipment: Two 12'x3' adjustable height tables (lab-type surface) on casters. 15 stools. Two bookcases (3'x7") and bookshelving. Three herbarium cabinets, two vertebrate cabinets (standard quarter cabinets), two entomology specimen cabinets (each with the capacity of 20 drawers), entomology cabinet for unit tray storage (this cabinet must sit on floor, 34"-3" tall, about 4.5' x 4.5'; note that entomology is willing to move current cabinet into new facility). Microscopes, one isozyme processing refrigerator and three standard refrigerators, one ultracold freezer, ovens. Desktop computers and monitors. Safety equipment as required.

Notes: 2' min. counter space required next to each sink.

Prototype Plan:



Notes:

3.2.5 Wet Biological Collections Work Area

5.3.3 Research and Collections

Description

Function: Non-public lab for research, work, prep and conservation related to Wet Biological Collection.

Capacity: 4 people.

Net Area: 400 nsf.

Adjacency/Access

Adjacent to: Bio Collections Work Area, Biological Collections (especially Fluid).

Access to: Research/Curator Offices & Labs, Collection Manager Office, Registrar.

Design Criteria

Architectural

Character: Clean, functional, state-of-the-art lab.

Openings: 4' access door.

Ceiling Height/Materials: 12' height / Acoustical ceiling tile (2x2) with dropped gypsum board soffits.

Walls: Painted gypsum board.

Floors: Seamless resilient flooring.

Other: Built-in solid surface (lab-top) counters with wall cabinets / open shelves above and lockable cabinets / drawers below.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment C (see Mechanical Section 4.3.3).

Lighting: Indirect ambient above cabinets with occupant sensors, direct tasklighting, under-cabinet lighting.

Power: Electric outlet strips above counter. Outlets at 10' oc along walls.

Plumbing: Two deep, lab-type stainless steel sink. Floor drain. Chemicals will possibly escape into drain; special attention should be made for drains and sediment traps (review code requirements during design).

Security: Medium Security (see Electrical Section 4.3.6).

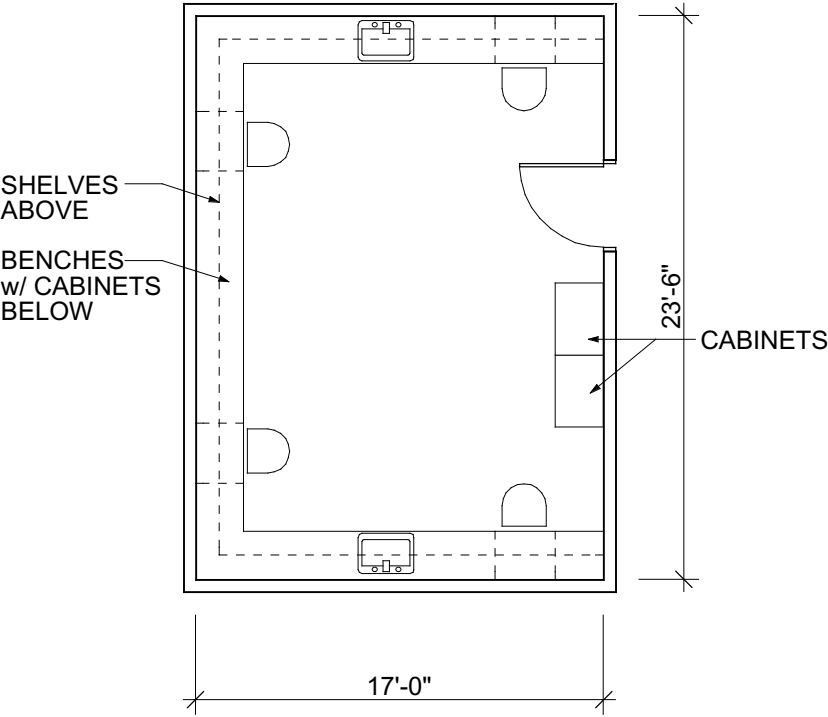
Phone/Data: Four telephone and network connections.

Other: Pre-action Sprinkler System.

Furnishings and Equipment: Desktop computers and monitors. 4 stools. Two lockable cabinets.

Notes: Review for any fire separation requirements during design phase.

Prototype Plan:



Notes:

3.2.6 Collections Managers/Visiting Scholar Offices 5.3.3 Research and Collections

Description

Function: Private office for the supervision and management of the adjacent Collection's Work Area and/or for visiting scholars.

Capacity: 1 person each.

Net Area: 8 @ 100 nsf each = 800 nsf.

Adjacency/Access

Adjacent to: Collection work area (see Adjacencies / Relationship Diagram for locations).

Access to: Collections, Research/Curator Offices & Labs, Registrar.

Design Criteria

Architectural

Character: Pleasant, comfortable, efficient, contemporary office for research.

Openings: Above counter window into collection work area. Natural light and views where possible. 3' access door.

Ceiling Height/Materials: 9' height / Acoustical ceiling tile (2x2).

Walls: Wood trim, painted gypsum board.

Floors: Carpet.

Other: Built-in wood shelving.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Indirect ambient, direct tasklighting.

Power: 110 v. outlets at each wall and one above desk.

Plumbing: N/A

Security: Low Security (see Electrical Section 4.3.6).

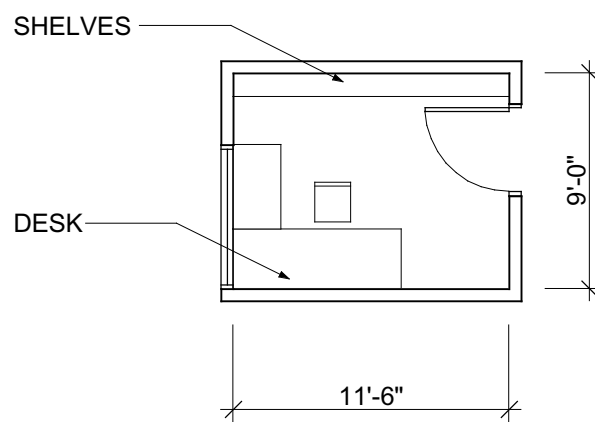
Phone/Data: Two telephone and network connections.

Other:

Furnishings and Equipment: 3'x6' desk with return. One desktop computer and monitor. Files and bookshelves. Upholstered chair on casters. Whiteboard. Blinds for window. Alternate layout may include counters and/or specimen cabinets.

Notes:

Prototype Plan:



Notes:

Description

Function: Shared office space for work related to adjacent Collections Work Areas.

Capacity: 2 or 3 people (see prototype plans).

Net Area: 700 nsf total:

Anthropology Technicians: 300 nsf.

Geology Technicians: 200 nsf.

Biology Technicians: 200nsf.

Adjacency/Access

Adjacent to: Collection Work Area (see Adjacencies / Relationship Diagram for locations).

Access to: Collections, Research/Curator Offices & Labs, Registrar.

Design Criteria

Architectural

Character: Pleasant, comfortable, efficient, contemporary office for research.

Openings: Above counter window into collection work area. Natural light and views where possible. 3' access door.

Ceiling Height/Materials: 9' height / Acoustical ceiling tile (2x2).

Walls: Wood trim, painted gypsum board.

Floors: Carpet

Other: Built-in wood shelving.

Systems

Structural: Building Standard (see Structural Section 4.3.2). 150 psf floor loading.

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Indirect ambient, direct tasklighting.

Power: 110 v. outlets at 10' oc along walls.

Plumbing: N/A

Security: Low Security (see Electrical Section 4.3.6).

Phone/Data: Telephone and network connections.

Other:

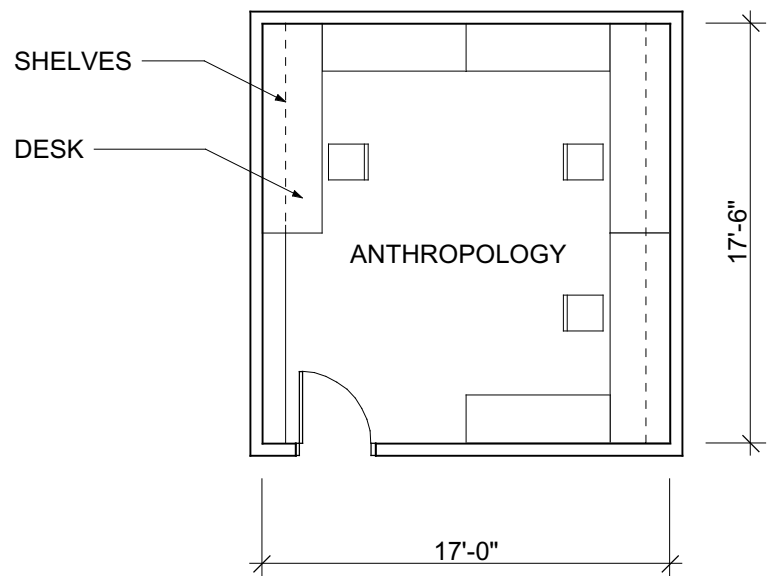
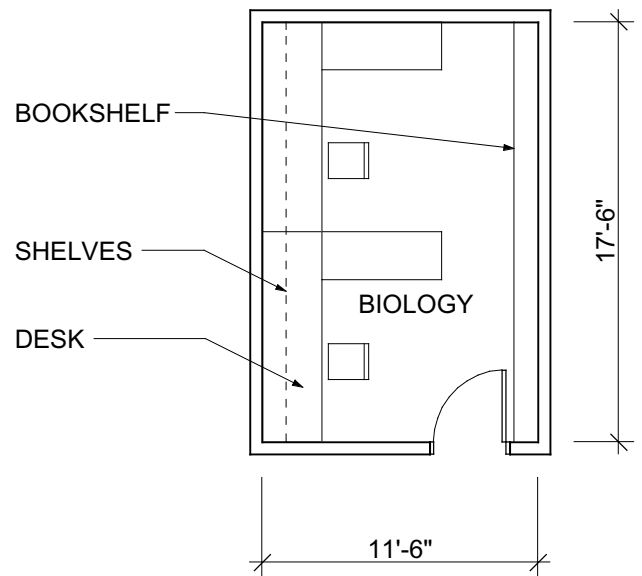
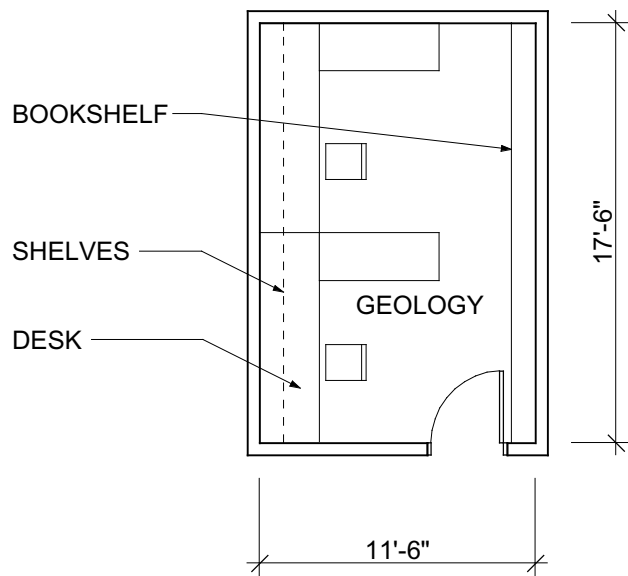
Furnishings and Equipment: Desks with returns. Desktop computers and monitos. Files and bookshelves. Upholstered chairs on casters. Whiteboard. Blinds for window.

Notes:

5.3.3 Research and Collections

3.2.7 Collections Technician Work Areas

Prototype Plan:



Notes:

3.2.8 Paleontology Casting Lab

5.3.3 Research and Collections

Description

Function: Non-public lab for producing fossil molds and casts.

Capacity: 2 people.

Net Area: 200 nsf.

Adjacency/Access

Adjacent to: Exhibits Department.

Access to: Geological Collections, Paleontology Prep Lab, Geology Clean Work Room, Research/Curator
Offices & Labs, Registrar.

Design Criteria

Architectural

Character: Clean, functional, state-of-the-art lab.

Openings: Double 3' access doors.

Ceiling Height/Materials: 12' height / Acoustical ceiling tile (2x2).

Walls: Painted gypsum board.

Floors: Seamless resilient flooring, acid resistant.

Other: Built-in solid surface (lab-top) counter with wall cabinets / open shelves above and lockable cabinets / drawers below. One hazardous chemical cabinet with exhaust.

Systems

Structural: Building Standard (see Structural Section 4.3.2). 150 psf floor loading. Forklift loads.

Mechanical: Environment C (see Mechanical Section 4.3.3).

Lighting: Indirect ambient above cabinets with occupant sensor., direct tasklighting, under-cabinet lighting.

Power: Electric outlet strips above counter and outlets at 10' oc along walls.

Plumbing: N/A

Security: Low Security (see Electrical Section 4.3.6).

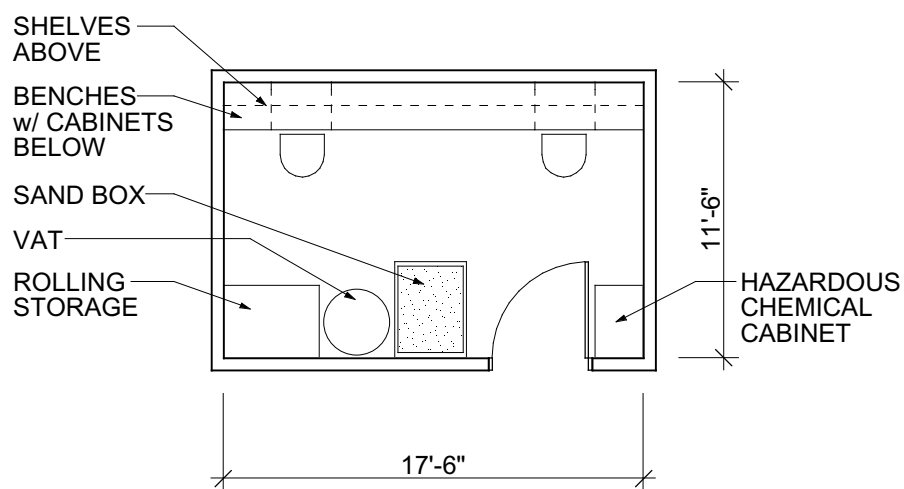
Phone/Data: Telephone and network connections.

Other: Exhaust for hazardous chemical cabinet. Overhead fan for vapour removal.

Furnishings and Equipment: Two stools. Storage cabinet for rolled supplies. Large Stainless steel vat for acid preparation. One sandbox table on casters. Desktop computers and monitors. Safety equipment as required.

Notes:

Prototype Plan:



Notes:

3.2.8.1 Registrar's Office

5.3.3 Research and Collections

Description

Function: Private office for Registrar.

Capacity: 1 person.

Net Area: 130 nsf.

Adjacency/Access

Adjacent to: Registrar's Work Area and Registrar's Secure Holding Room, Visual Archives.

Access to: Collections, Loading Dock, Labs/Work Area, Frozen Storage/Isolation Room, and Mobile Digital Image Capture Studio Storage.

Design Criteria

Architectural

Character: Pleasant, comfortable, efficient, contemporary. Designed as suite with Registrar's Work Area.

Openings: Views and natural light wherever possible. 3' access door.

Ceiling Height/Materials: 9' height / Acoustic ceiling tile.

Walls: Wood trim, painted gypsum board.

Floors: Carpet.

Other:

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment C (see Mechanical Section 4.3.3).

Lighting: Indirect ambient with occupant sensor, direct task lighting.

Power: 120 v. outlets at walls and at desk.

Plumbing: N/A

Security: Low Security (see Electrical Section 4.3.6).

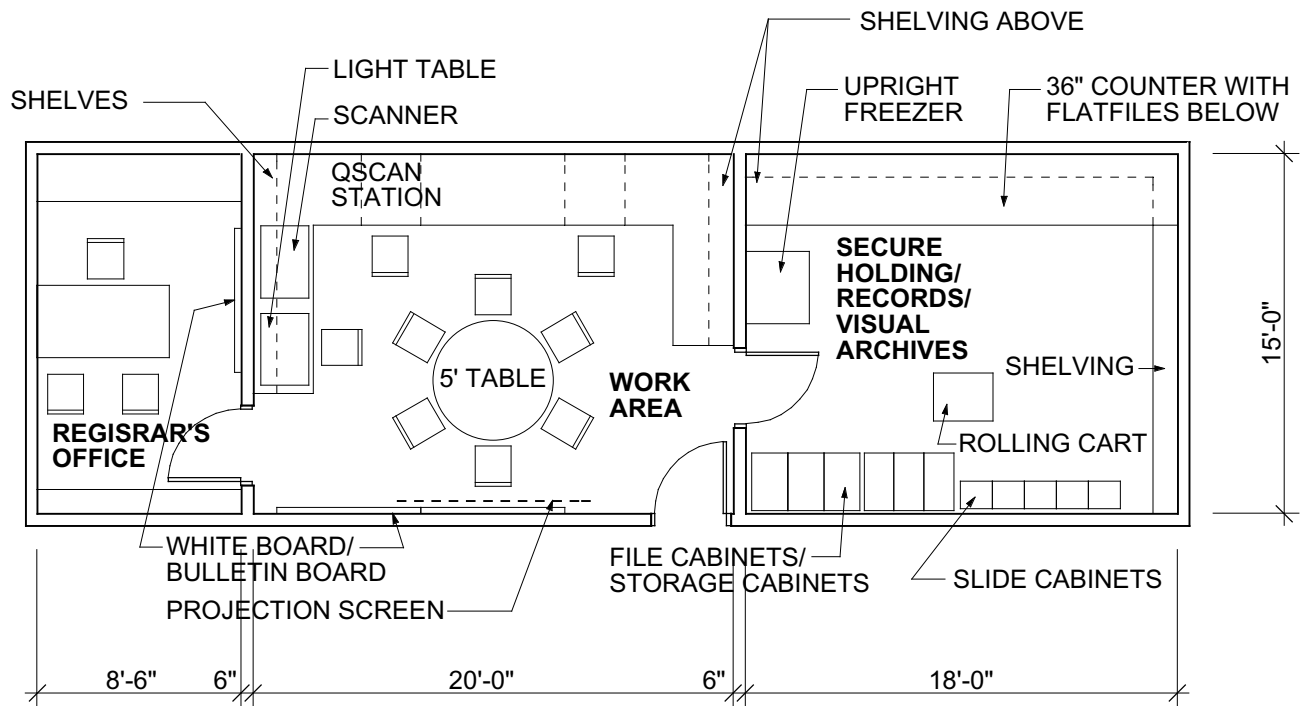
Phone/Data: Telephone and network connections at one wall and below desk. Wireless internet.

Other:

Furnishings and Equipment: Manager level desk, chair, and credenza. File cabinets, floor to ceiling bookshelves, two guest chairs. White board and bulletin board. Desktop computer and monitor. Laser printer.

Notes:

Prototype Plan:



Notes:

3.2.8.2 Registrar's Work Area

5.3.3 Research and Collections

Description

Function: Shared workspace for assistants, staff, volunteers, work-study students, and visiting scholars.

Also for training classes in computer applications, report writing, etc..

Capacity: 9 people.

Net Area: 300 nsf.

Adjacency/Access

Adjacent to: Registrar's Office, Registrar's Secure Holding Room, Visual Archives.

Access to: Staff Entry Collections, Loading Dock, Labs/Work Areas. Frozen storage / isolation room, mobile digital image capture studio storage.

Design Criteria

Architectural

Character: Pleasant, comfortable, efficient, contemporary. Designed as suite with Registrar's office.

Openings: Views and natural light whenever possible. Secure double 3' doors.

Ceiling Height/Materials: 9' height / Acoustic ceiling tile.

Walls: Wood trim, painted gypsum board.

Floors: Carpet.

Other: Built-in solid-surface counter with some cabinet storage below.

Systems

Structural: Building Standard (see Structural Section 4.3.2). 150 psf floor loading.

Mechanical: Environment C (see Mechanical Section 4.3.3).

Lighting: Indirect ambient with occupant sensors, direct task lighting. Track at white/bulletin boards.

Power: Electrical outlets above counter and at 10' oc along walls. Power for roll-down projection screen.

Plumbing: N/A

Security: Medium Security (see Electrical Section 4.3.6).

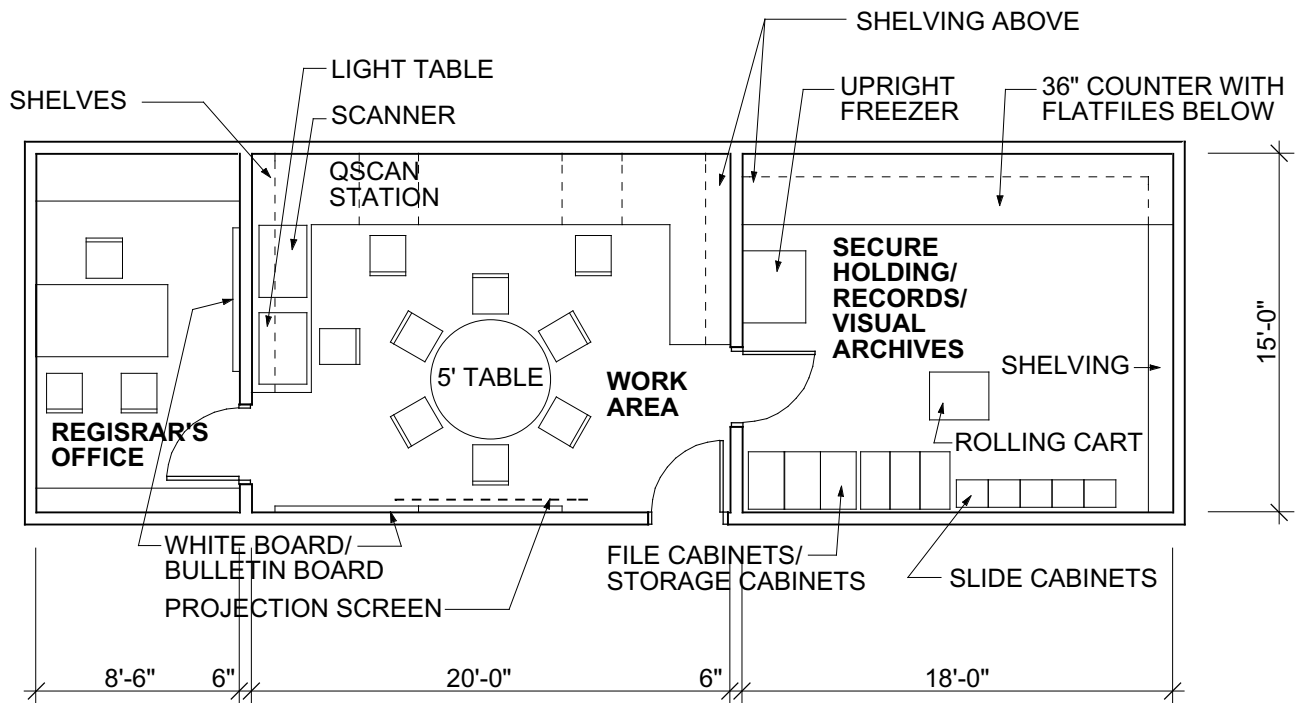
Phone/Data: Telephone and network connections at 10' oc along wall. Wireless internet.

Other: Pre-action Sprinkler System.

Furnishings and Equipment: Five foot diameter table with six chairs. Six laptop computers (with wireless internet cards). Laser printer, scanner, and a light table. LCD projector. Roll-down projection screen. White board and bulletin board.

Notes:

Prototype Plan:



Notes:

3.2.8.3 Registrar's Secure Holding Room

5.3.3 Research and Collections

Description

Function: Accession records, visual archives (slides, digital media, etc.), temporary storage area for collections entering or leaving Museum.

Capacity: --

Net Area: 270 nsf.

Adjacency/Access

Adjacent to: Registrar's Work Area and Registrar's Office.

Access to: Loading Dock (Freight Elevator), Collections, Labs, Classrooms, Exhibits Department.

Design Criteria

Architectural

Character: Unobtrusive, secure, efficient.

Openings: Secure, double 3' access doors.

Ceiling Height/Materials: 10' minimum / Painted gypsum board.

Walls: Painted gypsum board.

Floors: Seamless resilient flooring.

Other: Built-in solid surface counter with shelving above and cabinets below. Built-in floor to ceiling shelves.

Systems

Structural: Building Standard (see Structural Section 4.3.2). 150 psf floor loading.

Mechanical: Environment C (see Mechanical Section 4.3.3).

Lighting: Color corrected indirect fluorescent uplights with occupant sensors.

Power: 120 v./20 amp outlets (multiple for future refrigerators).

Plumbing: No overhead pressurized water or waste piping.

Security: High Security (see Electrical Section 4.3.6).

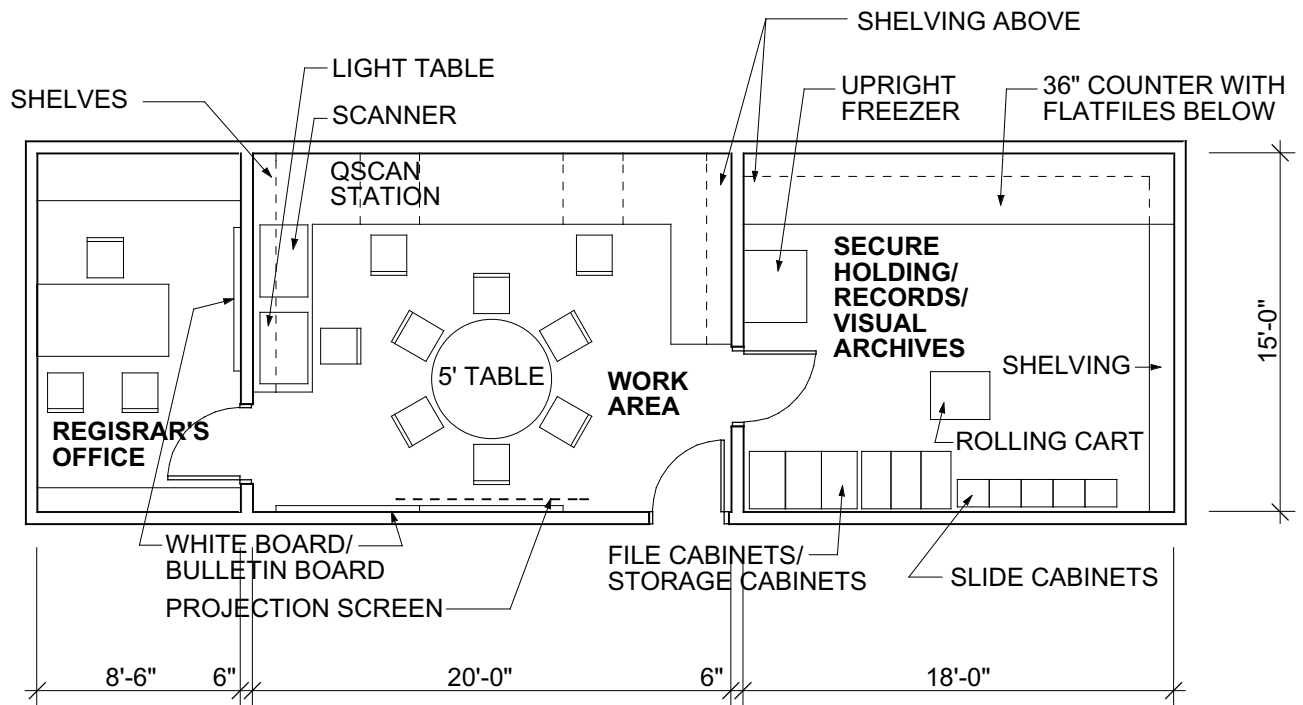
Phone/Data: Minimum of two telephone and network connections.

Other: Pre-action Sprinkler System. No cleanouts or equipment access above.

Furnishings and Equipment: One upright standard refrigerator. Fix 4-drawer file cabinets. Cabinets for photo and data CD's, slides, original photos, and other media. Rolling carts for object transport.

Notes:

Prototype Plan:



Notes:

3.3.1 Curator / Research Offices

5.3.3 Research and Collections

Description

Function: Private office for a Curator or a Research Administrator.

Capacity: 1 person each.

Net Area: 8 @ 130 nsf each = 1040 nsf.

Adjacency/Access

Adjacent to: Other Curator/Research Offices and Visiting Scholars.

Access to: Labs, Research Spaces (including shared spaces), Collections, Collection Managers.

Design Criteria

Architectural

Character: Pleasant, comfortable, efficient, contemporary office for work and research.

Openings: Natural light and views where possible. 3' access door.

Ceiling Height/Materials: 9' height / Acoustical ceiling tile (2x2).

Walls: Wood trim, painted gypsum board.

Floors: Carpet.

Other: Built-in wood shelving.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Indirect ambient with occupant sensors, direct task lighting.

Power: 110 v. outlets at each wall and one above desk.

Plumbing: N/A

Security: Low Security (see Electrical Section 4.3.6).

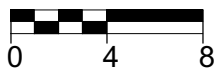
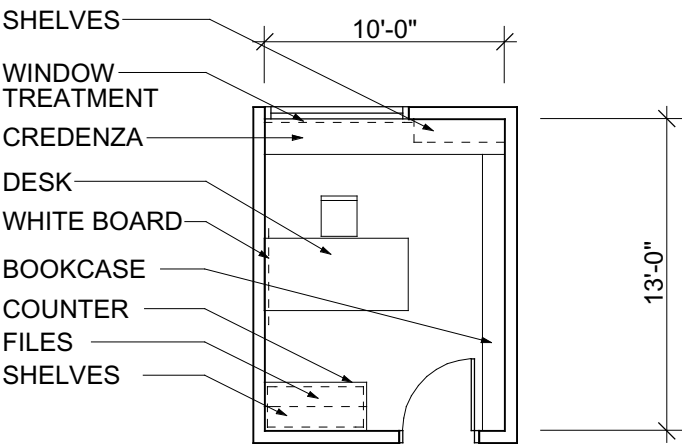
Phone/Data: Two telephone and network connections.

Other:

Furnishings and Equipment: 3'x6' desk. Alternate: counter or credenza, specimen case. One desktop computer and monitor. Files and bookshelves. Upholstered chair on casters. White board. Blinds for window.

Notes:

Prototype Plan:



Notes:

3.3.2 Graduate Student Study Area

5.3.3 Research and Collections

Description

Function: Shared open office for Graduate Student study.

Capacity: 1 person each.

Net Area: 16 @ 75 nsf each = 1200 nsf.

Adjacency/Access

Adjacent to: Other Research Work Areas and shared spaces.

Access to: Labs, Collections, Staff Lounge.

Design Criteria

Architectural

Character: Friendly, collegiate, collaborative.

Openings: Could be open to corridor or an open space surrounded by enclosed areas.

Ceiling Height/Materials: 9' height / Acoustic ceiling tile.

Walls: Wood trim, painted gypsum board.

Floors: Carpet.

Other: Closets for coats and personal items.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Indirect ambient, direct task lighting.

Power: 110 v. outlets at walls and below desks.

Plumbing: N/A

Security: Low Security (see Electrical Section 4.3.6).

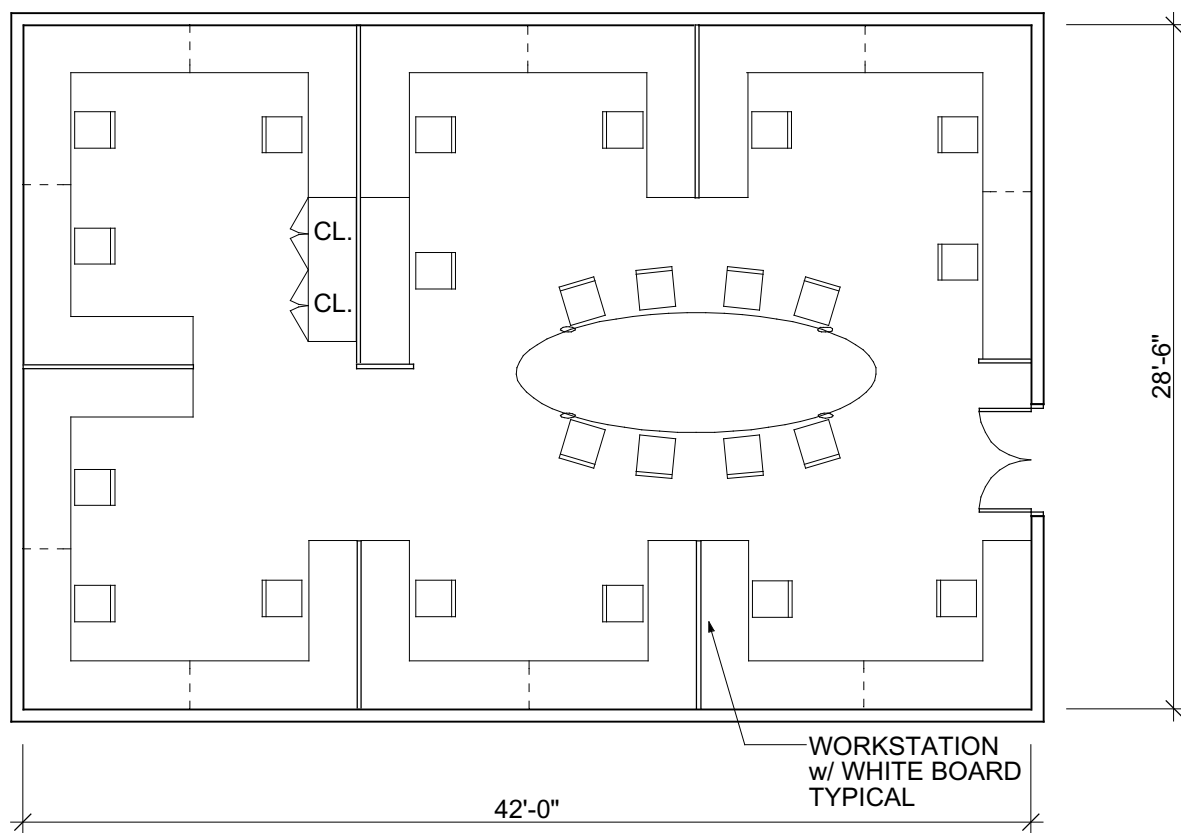
Phone/Data: Two telephone network connections per workstation.

Other:

Furnishings and Equipment: Staff level work surfaces, chairs, and partitions. One desktop computer and monitor at each work station. Shared central work table and chairs. Files and bookshelves. White boards.

Notes: These suites will require an internal circulation factor of 25%.

Prototype Plan:



Notes:

3.3.3 Visiting Scholar Offices

5.3.3 Research and Collections

Description

Function: Private office for a Visiting Scholar.

Capacity: 1 person (2 maximum) each.

Net Area: 2 @ 130 nsf each = 260 nsf.

Adjacency/Access

Adjacent to: Curator/Research Offices and other Visiting Scholars.

Access to: Labs, Research Spaces (including shared spaces), Collections, Collection Managers.

Design Criteria

Architectural

Character: Pleasant, comfortable, efficient, contemporary office for work and research.

Openings: Natural light and views where possible. 3' access door.

Ceiling Height/Materials: 9' height / Acoustical ceiling tile.

Walls: Wood trim, painted gypsum board.

Floors: Carpet.

Other: Built-in solid surface counter wood shelving.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Indirect ambient, direct task lighting.

Power: 110 v. outlets at each wall and two above desk.

Plumbing: N/A

Security: Low Security (see Electrical Section 4.3.6).

Phone/Data: Four telephone and network connections each.

Other:

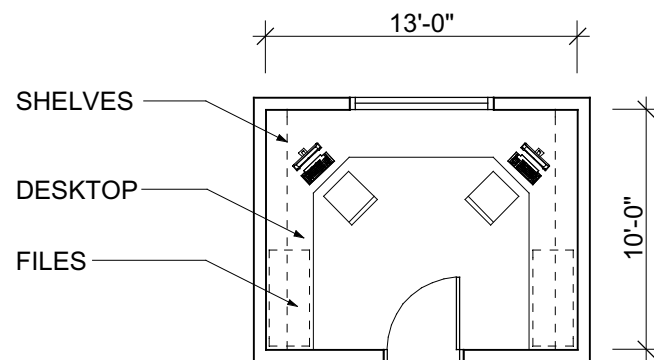
Furnishings and Equipment: Two desktop computers and monitors. Under-counter files. Upholstered chair on casters. White board. Blinds for window.

Notes:

5.3.3 Research and Collections

3.3.3 Visiting Scholar Offices

Prototype Plan:



Notes:

3.3.4.1 Archaeology Laboratory

5.3.3 Research and Collections

Description

Function: Lab for education, preparation, care, and research related to the archaeology collection.

Capacity: 40 people.

Net Area: 1000 nsf.

Adjacency/Access

Adjacent to: Curator/Research Offices.

Access to: 5.3.2 Public Program Spaces, Research/Lab areas.

Design Criteria

Architectural

Character: Clean, pleasant, comfortable, efficient, contemporary.

Openings: Two 3' doors.

Ceiling Height/Materials: 12' height / Acoustical ceiling tiles.

Walls: Painted gypsum board.

Floors: Seamless resilient flooring.

Other: Built-in solid surface counters (lab-type) with lockable steel wall cabinets above and lockable cabinets/drawers below.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment C with make-up air (see Mechanical Section 4.3.3).

Lighting: Indirect ambient above cabinets with occupant sensors, direct task lighting below (separately switched).

Power: Power strip mounted above counter (divided into three 20 amp circuits). Four 110 v. flush floor outlets or ceiling drop power (review during design phase).

Plumbing: Two stainless steel, double sinks with self-draining 3' side extensions with lips. Faucets need lab heads for attaching tubing. Large and easily cleaned sediment traps. Floor drain with large and easily cleaned sediment trap.

Security: Low Security (see Electrical Section 4.3.6).

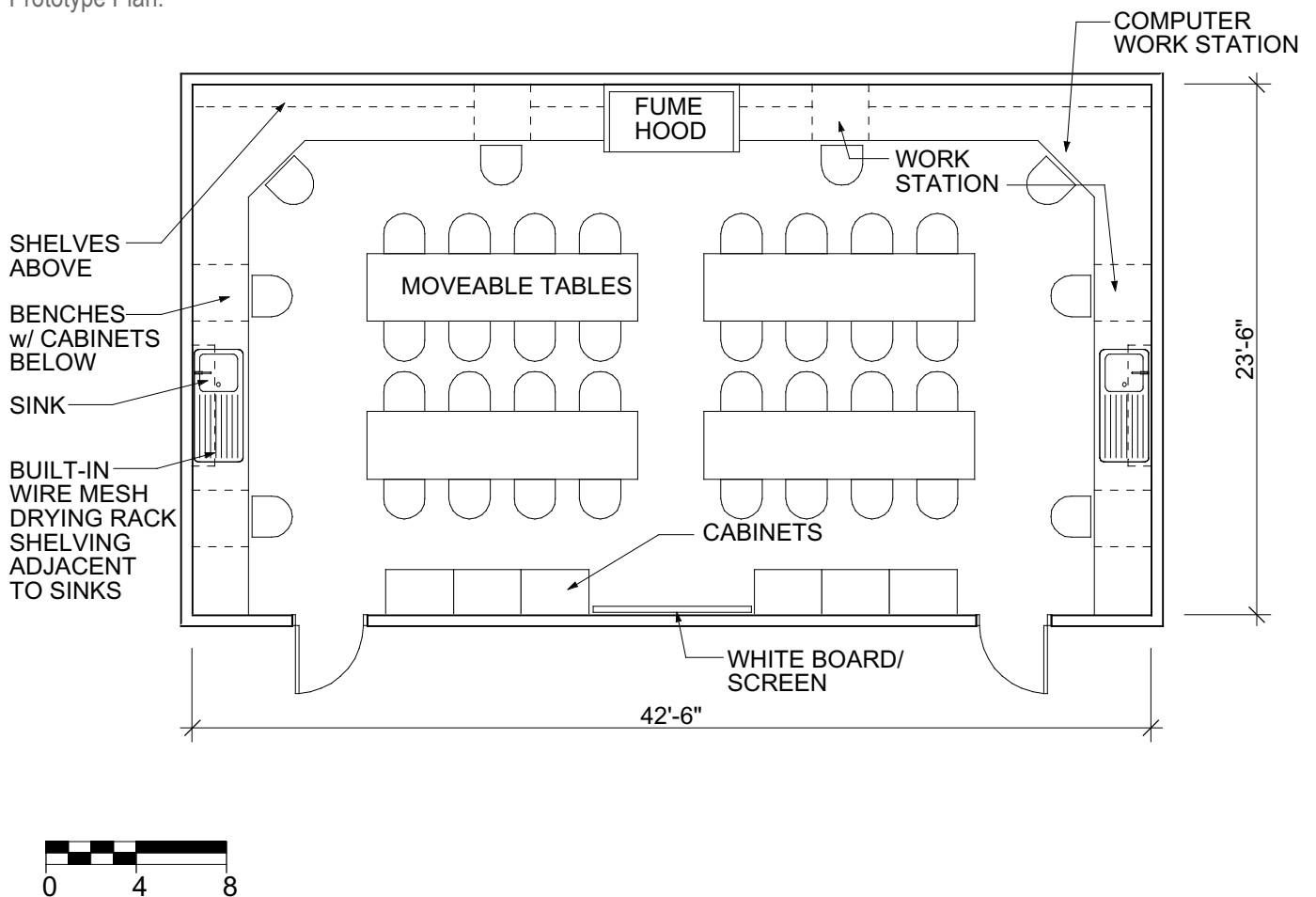
Phone/Data: Two telephone and network connections at each work station. Wireless network.

Other: Exhaust for fume hood.

Furnishings and Equipment: Four 3' x 12' adjustable height (lab-type surface) tables with 32 stackable chairs. Two stereoscopic dissecting microscopes, one with an imaging head for capturing digital images onto CD's. Chemical fume hood. Specimen cabinets with locks, large steel equipment cabinets with shelves and locks, a hazardous/flammable storage cabinet, and map files. Two laptop computers. White board (serves as projection screen). LCD projector. Safety equipment as required.

Notes: Under-counter cabinets should allow for six lab workstations plus two corner computer workstations (no cabinets above workstations). The two computer stations need several feet of clear counter space on each side. Two of the six lab workstations will be dedicated microscope stations. Fume hood ideally between the two remote sinks. Coordinate doors and openings widths with user -- consideration of wider openings is encouraged and should be coordinated with room layout and size of fossils being moved into the space.

Prototype Plan:



Notes:

3.3.4.2 Wet Lab

5.3.3 Research and Collections

Description

Function: Wet lab for cross-disciplinary research.

Capacity: 4 people.

Net Area: 275 nsf.

Adjacency/Access

Adjacent to: Curator/Research Offices, Visiting Scholar.

Access to: Labs, Research Spaces (including shared spaces), Collections, Collection Managers.

Design Criteria

Architectural

Character: Inviting, exciting and inspiring lab environment.

Openings: Double 3' access doors.

Ceiling Height/Materials: 12' height / Acoustical ceiling tiles.

Walls: Painted gypsum board.

Floors: Seamless resilient flooring,

Other: Built-in solid surface counters (lab-type) with continuous lockable wall cabinets above and lockable cabinets / drawers below.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment C (see Mechanical Section 4.3.3).

Lighting: Indirect ambient above cabinets with occupant sensors, direct task lighting, track lighting at bulletin/cork/white board.

Power: Electrical outlet strips above counter and outlets at 10' oc along walls. Review all power requirements for equipment during design phase.

Plumbing: Three deep lab-type stainless steel sinks capable of handling soil disposal.

Security: Low Security (see Electrical Section 4.3.6).

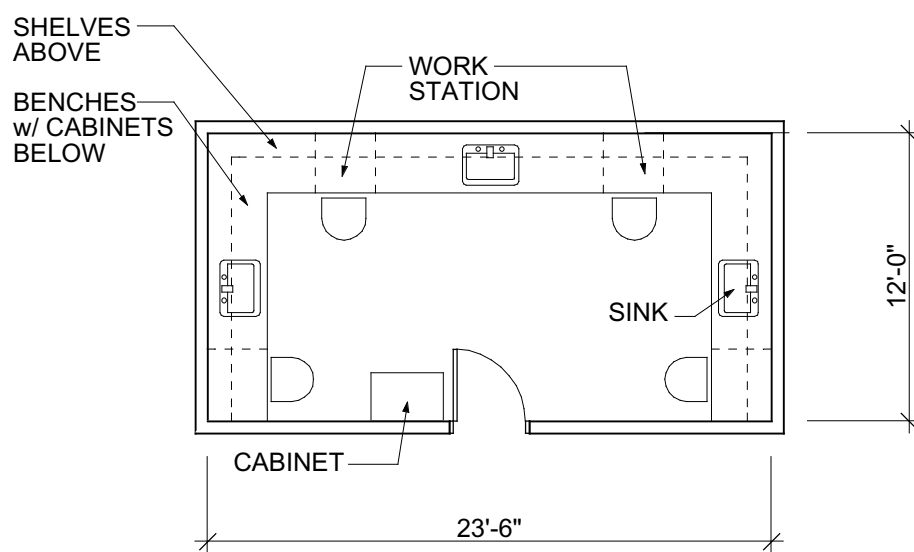
Phone/Data: Telephone and network connections at 10' oc. Wireless internet.

Other: Four gas and air outlets at counters.

Furnishings and Equipment: Power should be capable to operate multiple pieces of lab equipment simultaneously. Storage cabinet (lockable). Desktop computers and monitors. Bulletin / cork boards and large white board. Safety station as required.

Notes:

Prototype Plan:



Notes:

3.3.4.3 Dry Lab

5.3.3 Research and Collections

Description

Function: Dry lab for cross-disciplinary research.

Capacity: 4 people.

Net Area: 275 nsf.

Adjacency/Access

Adjacent to: Curator/Research Offices, Visiting Scholar.

Access to: Labs, Research Spaces (including shared spaces), Collections, Collection Managers.

Design Criteria

Architectural

Character: Inviting, exciting and inspiring lab environment.

Openings: Double 3' access doors.

Ceiling Height/Materials: 12' height / Acoustical ceiling tiles.

Walls: Painted gypsum board.

Floors: Seamless resilient flooring.

Other: Built-in solid surface counters (lab-type) with continuous lockable wall cabinets above and lockable cabinets / drawers below.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment C (see Mechanical Section 4.3.3).

Lighting: Indirect ambient above cabinets with occupant sensors, direct task lighting, track lighting at bulletin/cork/white board.

Power: Electrical outlet strips above counter and outlets at 10' oc along walls.

Plumbing: One deep lab-type stainless steel sink capable of handling soil disposal.

Security: Low Security (see Electrical Section 4.3.6).

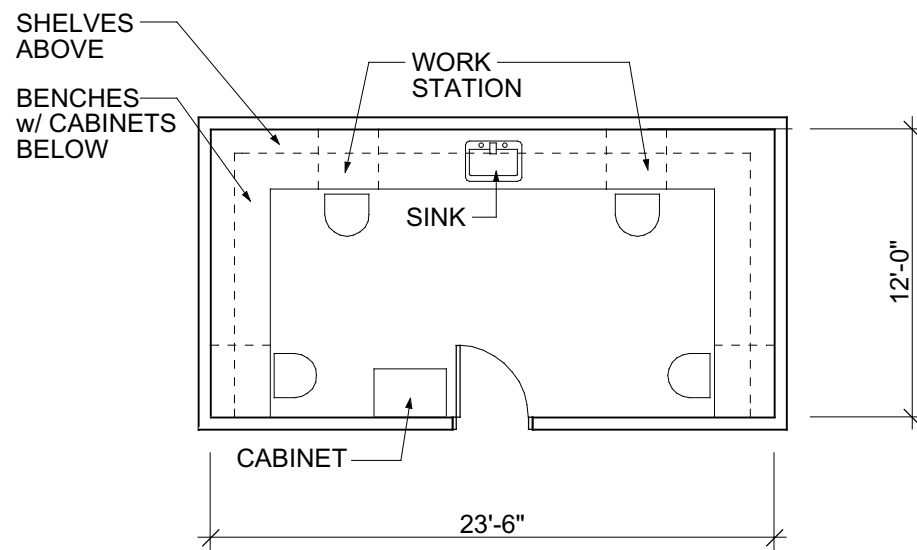
Phone/Data: Telephone and network connections at 10' oc. Wireless internet.

Other: Four gas and air outlets at counters.

Furnishings and Equipment: Power should be capable to operate multiple pieces of lab equipment simultaneously. Storage cabinet (lockable). Desktop computers and monitors. Bulletin / cork boards and large white board. Safety station as required.

Notes: Alternate layout may include specimen cabinets.

Prototype Plan:



Notes:

3.3.4.4 Genetics Research and Preparation Lab

5.3.3 Research and Collections

Description

Function: Shared facility catering to the needs of GLSC, Biology, and Anthropology staff, faculty, and students.

Capacity: 15 people.

Net Area: 900 nsf (150 nsf DNA Extraction Area, 275 nsf PCR Set-Up Lab, 75 nsf PCR Machine Room, 400 sf Post-PCR Lab).

Adjacency/Access

Adjacent to: Curator/Research Offices, Visiting Scholar.

Access to: Labs, Genelab, Research Spaces (including shared spaces), Collections, Collection Managers.

Design Criteria

Architectural

Character: Clean, pleasant, comfortable, efficient, contemporary.

Openings: 3' doors with vestibules.

Ceiling Height/Materials: 12' height / Acoustical ceiling tiles.

Walls: Painted gypsum board.

Floors: Seamless resilient flooring.

Other: Spaces should not allow drafts through doorways that could transmit target DNA molecules (i.e. vestibule entries). Built-in solid surface (lab-type) counter with lockable cabinets above and lockable cabinets/drawers below.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3). PCR Set-Up Lab should be HEPA filtered.
All rooms positively pressured.

Lighting: UV ceiling light capability. Indirect ambient with occupant sensors, direct task lighting.

Power: Power strips above all counters. Outlets at 10' oc along walls.

Plumbing: One deep stainless steel lab-type sink with its own filtration system.

Security: Low Security (see Electrical Section 4.3.6).

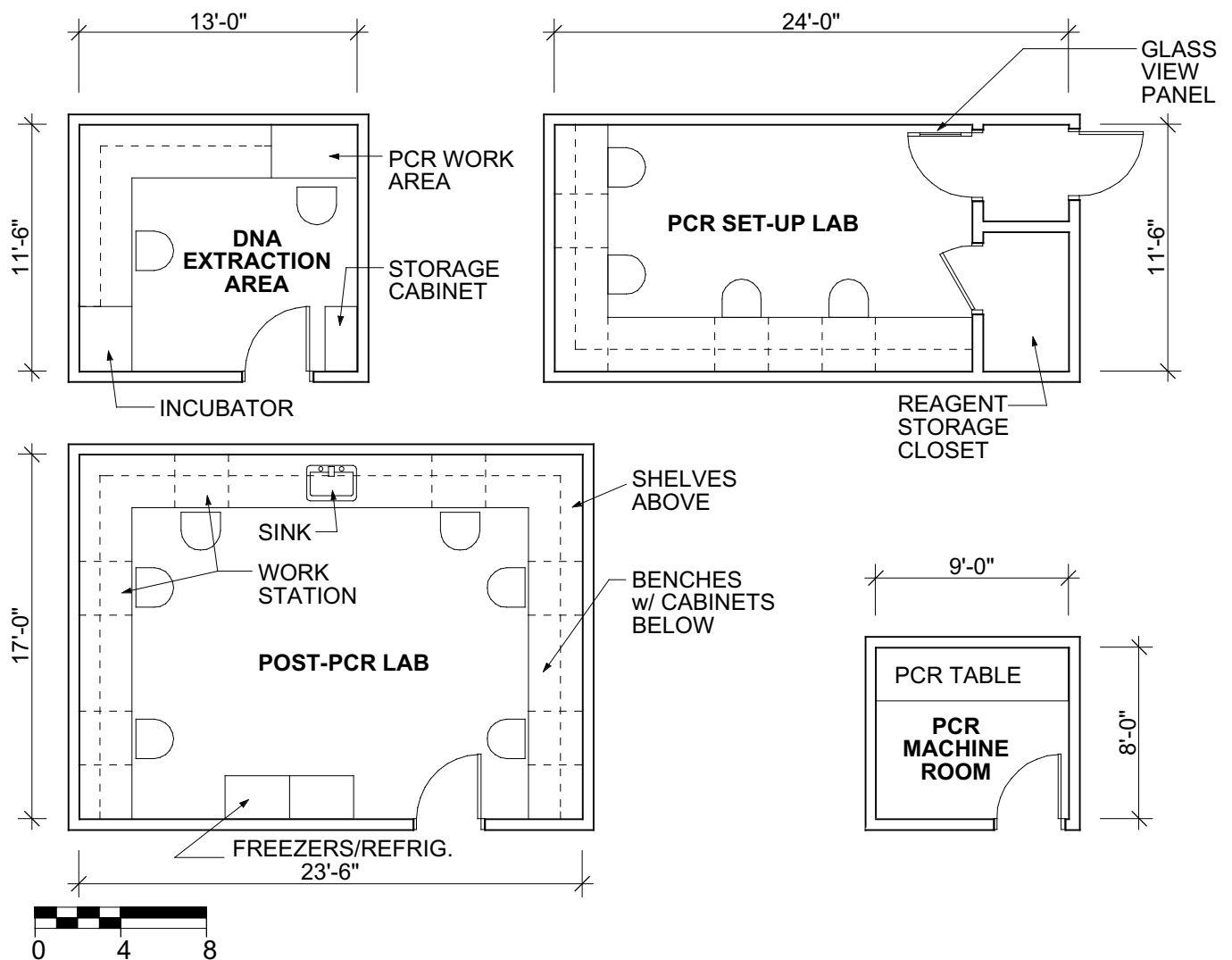
Phone/Data: Minimum of two telephone and network connections at each work station. Wireless network.

Other: Four gas and air outlets at counters in post-PCR/Prelab.

Furnishings and Equipment: 15 chairs. PCR machine for PCR Machine Room. Each work area in the PCR Set-Up Lab should be equipped with a PCR workstation that has its own HEPA air filter and UV light source, as well as a UV crosslinker and small centrifuge. Refrigerators and freezers, gel rigs, photo documentation equipment, sequencer, etc.. Storage cabinets (lockable). Desktop computers and monitors. Safety equipment as required.

Notes: PCR Set-Up Room needs to be fully isolated. The DNA Extraction Area and the Post-PCR/Prelab Room can be adjacent. Post-PCR/Prelab serves also as preparation and developing new activities for Genelab.

Prototype Plan:



Notes: PCR Set-Up Lab should be spatially isolated from heavy traffic areas to reduce potential for human DNA contamination.

3.4.1 Shared Meeting Room / Classroom

5.3.3 Research and Collections

Description

Function: Meeting space for 5.3.3 Research and Collections Area as well as a classroom for up to 24 people.

Capacity: 24 people.

Net Area: 450 nsf.

Adjacency/Access

Adjacent to: Common corridor/space in 5.3.3 Research and Collections Area.

Access to: Offices, labs, research spaces, and shared areas of 5.3.3 Research and Collections.

Design Criteria

Architectural

Character: Inviting, pleasant, comfortable, efficient, contemporary.

Openings: 3' access door.

Ceiling Height/Materials: 9' minimum / Acoustical ceiling tile (2x2) and gypsum board soffits.

Walls: Painted gypsum board.

Floors: Carpet.

Other: Built-in solid surface counter with lockable wall cabinets above and lockable cabinets/drawers below.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Indirect ambient above cabinets with occupant sensors, direct , track lighting at bulletin/cork/white board.

Power: Electrical outlet strip above counter and outlets at 10' oc along walls. Four 220 v. flush floor outlets. Power for roll-down screen.

Plumbing: One sink.

Security: University standard.

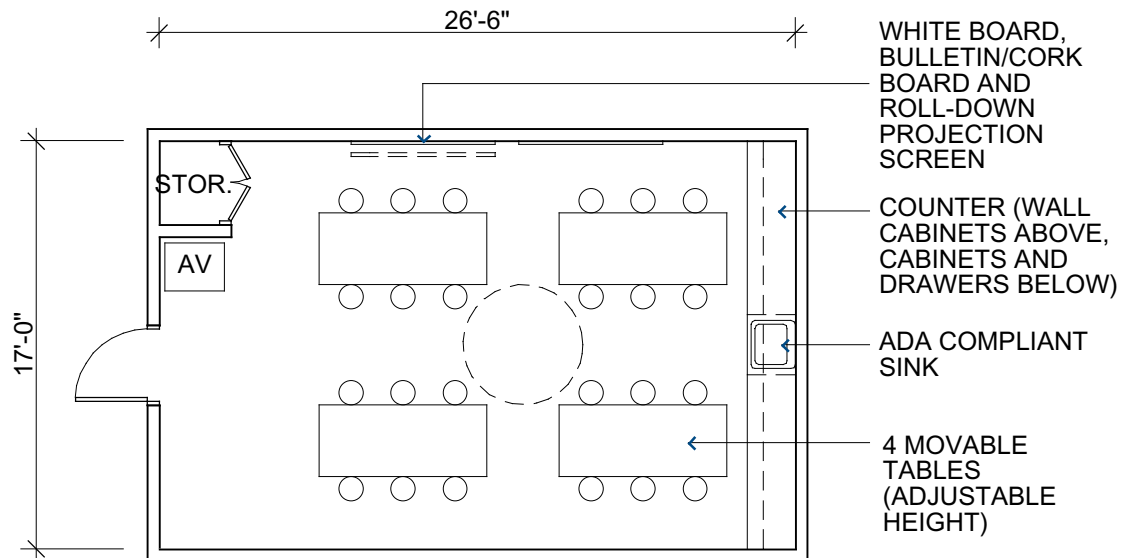
Phone/Data: Telephone and network connections. Wireless internet.

Other: One gas and air outlet at counter.

Furnishings and Equipment: Four 3x7 adjustable height tables with 24 stools. Moveable A/V console with LCD projects, DVD/CD player, connection for computer, speakers, VCR (project via LCD projector). Bulletin/cork boards and large white board. Roll-down projection screen. Safety equipment as required.

Notes: Storage room should be secure for storage of computers and microscopes.

Prototype Plan:



Notes:

3.4.2 Shared Copier / Printer / Supplies

5.3.3 Research and Collections

Description

Function: Common storage and copy/printing room for 5.3.3 Research and Collections Area.

Capacity: --

Net Area: 100 nsf.

Adjacency/Access

Adjacent to: Common corridor/space in 5.3.3 Research and Collections Area.

Access to: Offices, labs, research spaces, and shared areas of 5.3.3 Research and Collections.

Design Criteria

Architectural

Character: Simple, clean, efficient, secure.

Openings: 3' access door.

Ceiling Height/Materials: 9' height / Acoustical ceiling tile.

Walls: Painted gypsum board.

Floors: Carpet.

Other: Built-in solid surface counter with shelves above and lockable cabinets below.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Recessed fluorescent with occupant sensors.

Power: Power strip above counter. Outlet on other walls at floor.

Plumbing: N/A

Security: University standard.

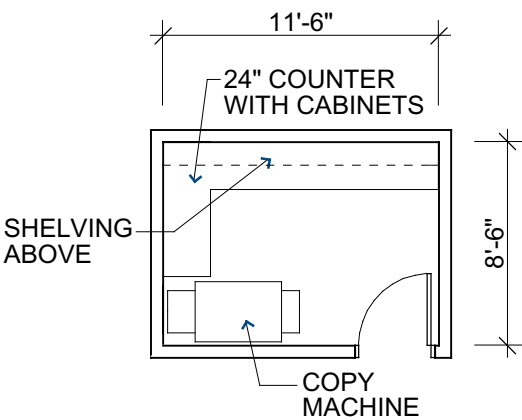
Phone/Data: Telephone and network connections.

Other:

Furnishings and Equipment: Copier and printer.

Notes:

Prototype Plan:



Notes:

3.4.3 Staff Restrooms

Description

Function: One male and one female toilet rooms for staff.

Capacity: --

Net Area: 230 nsf.

Adjacency/Access

Adjacent to: 5.3.3 Research and Collections spaces.

Access to: Custodial Closet.

Design Criteria

Architectural

Character: Clean, smooth, durable, efficient.

Openings: Single 3' door with privacy baffle to public circulation.

Ceiling Height/Materials: 8' minimum / Epoxy painted gypsum board with dropped soffits over sinks.

Walls: Ceramic tile.

Floors: Ceramic tile.

Other: Mirror over sink. Stainless steel partitions and accessories.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D with direct exhaust (see Mechanical Section 4.3.3).

Lighting: Baffled fluorescent over sinks. Recessed downlights elsewhere.

Power: Code standard.

Plumbing: Faucets, urinals, and toilets with sensors. Sink and floor drain.

Security: University standard.

Phone/Data: N/A.

Other:

Furnishings and Equipment: Sink, faucet, floor drain, toilet. Stainless steel accessories including soap, towel and toilet paper dispensers, sanitary napkin disposal bin, trash can, towel bin, mirror, coat hooks.

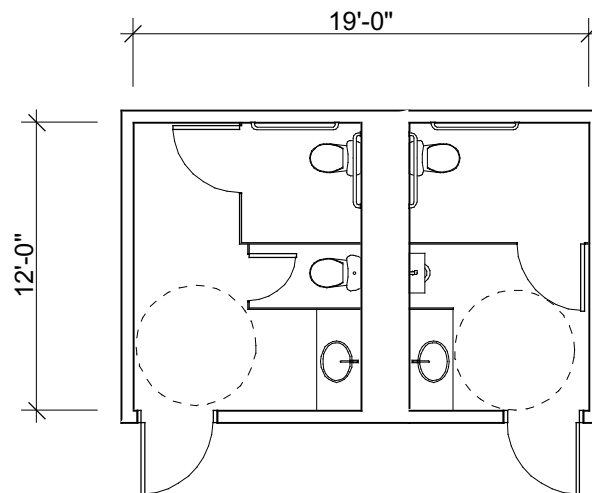
Notes: ADA accessible.

5.3.3 Research and Collections

5.3.3 Research and Collections

3.4.3 Staff Restrooms

Prototype Plan:



Notes: Restroom fixture counts are based on the following:

Public Restrooms

Female: 32 water closets / 12 lavatories

Male: 18 water closets / 12 lavatories

Staff Restrooms

Female: 6 water closets / 3 lavatories

Male: 6 water closets / 3 lavatories

These are preliminary counts based on the program square footage. Actual fixture counts must be verified during the design based on the actual size/configuration of the Museum.

3.4.4 Coat Closets

5.3.3 Research and Collections

Description

Function: Storage of coats for 5.3.3 Research and Collections Area.

Capacity: 40 coats (each closet).

Net Area: 5 @ 10 nsf each = 50 nsf.

Adjacency/Access

Adjacent to: 5.3.3 Research and Collections Area Entry.

Access to: Offices, labs, research spaces, and shared areas of 5.3.3 Research and Collections.

Design Criteria

Architectural

Character: Simple, clean, efficient, secure.

Openings: Double 30" doors.

Ceiling Height/Materials: 8' minimum height / Accessible acoustical ceiling tile.

Walls: Durable wood and painted gypsum board surfaces.

Floors: Carpet.

Other: Built-in shelf.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: N/A

Lighting: N/A

Power: Code standard.

Plumbing: N/A

Security: University standard.

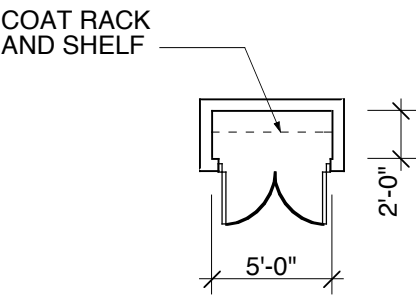
Phone/Data: N/A

Other:

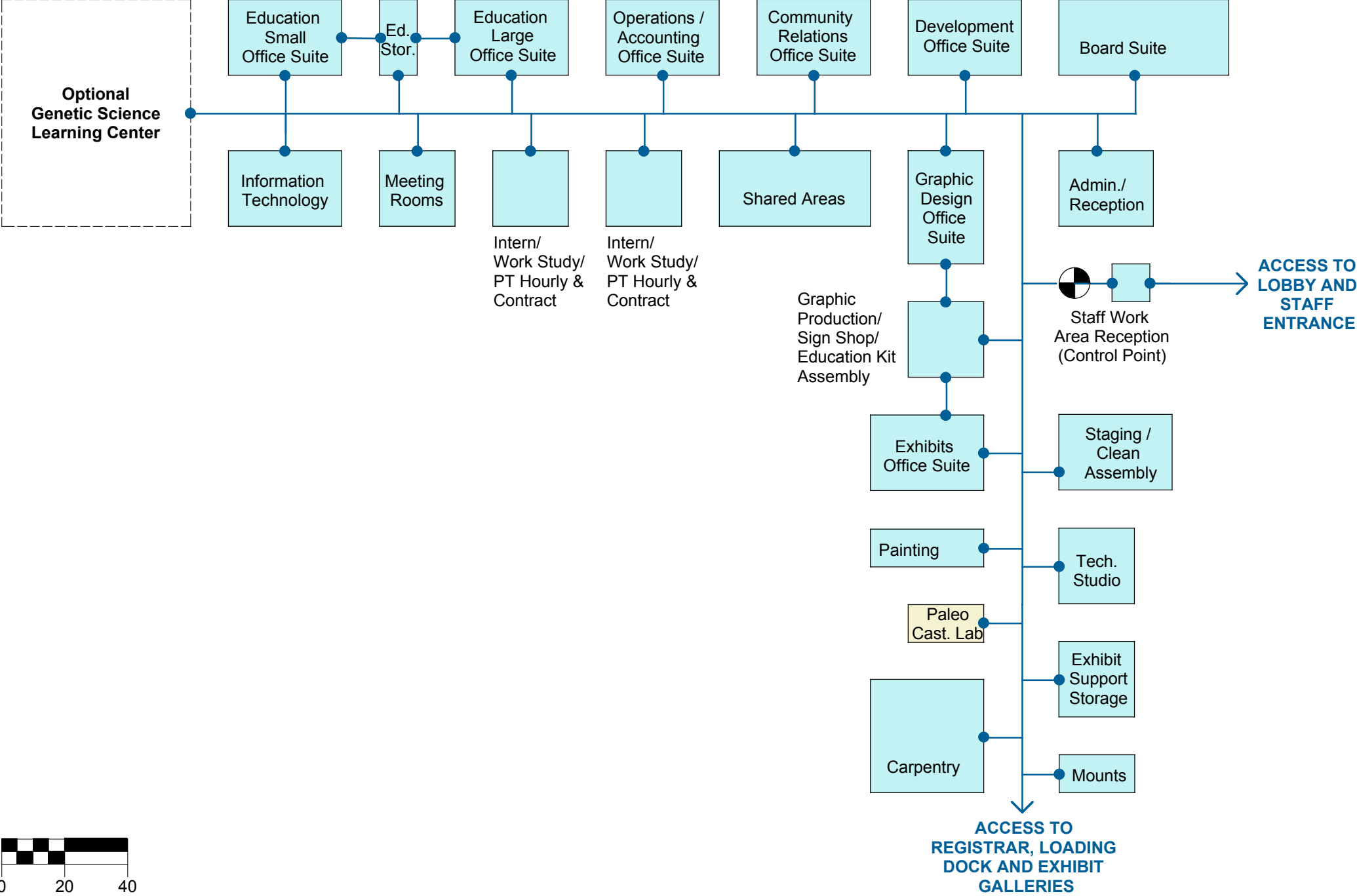
Furnishings and Equipment: Built-in hanger rod.

Notes: Ceiling of this space can be used as an access point to above ceiling equipment.

Prototype Plan:



Notes:



Description

Function: Conference room for meetings and presentations of the staff, the Board, and occasionally groups outside the Museum.

Capacity: 20 at table, 64 in rows.

Net Area: 1,100 nsf.

Adjacency/Access

Adjacent to: Kitchenette, Board Suite Storage, Coat Closet, Administrative/Reception Suite.

Access to: Other Work Areas, Lobby, Staff Toilets, Copy Room.

Design Criteria

Architectural

Character: Expressive of the unique personality of the Museum. Bright, natural light.

Openings: Double 3’ doors at entry. Windows placed for dramatic views.

Ceiling Height/Materials: 12’ preferred / Elegant acoustic panels.

Walls: Skim coat plaster over gypsum board with plywood backup.

Floors: Wood or modular carpet tile.

Other: Extensive and dynamic use of museum artifacts and ecofacts as items of interest.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment C (see Mechanical 4.3.3).

Lighting: Dimmable track lighting at perimeter. Dimmable downlights with occupant sensors over table. Spotlight for presentation.

Power: 120 v. convenience outlets at perimeter and below table. Additional power as required for final A/V plan.

Plumbing: N/A; See Kitchenette.

Security: Low Security (see Electrical Section 4.3.6).

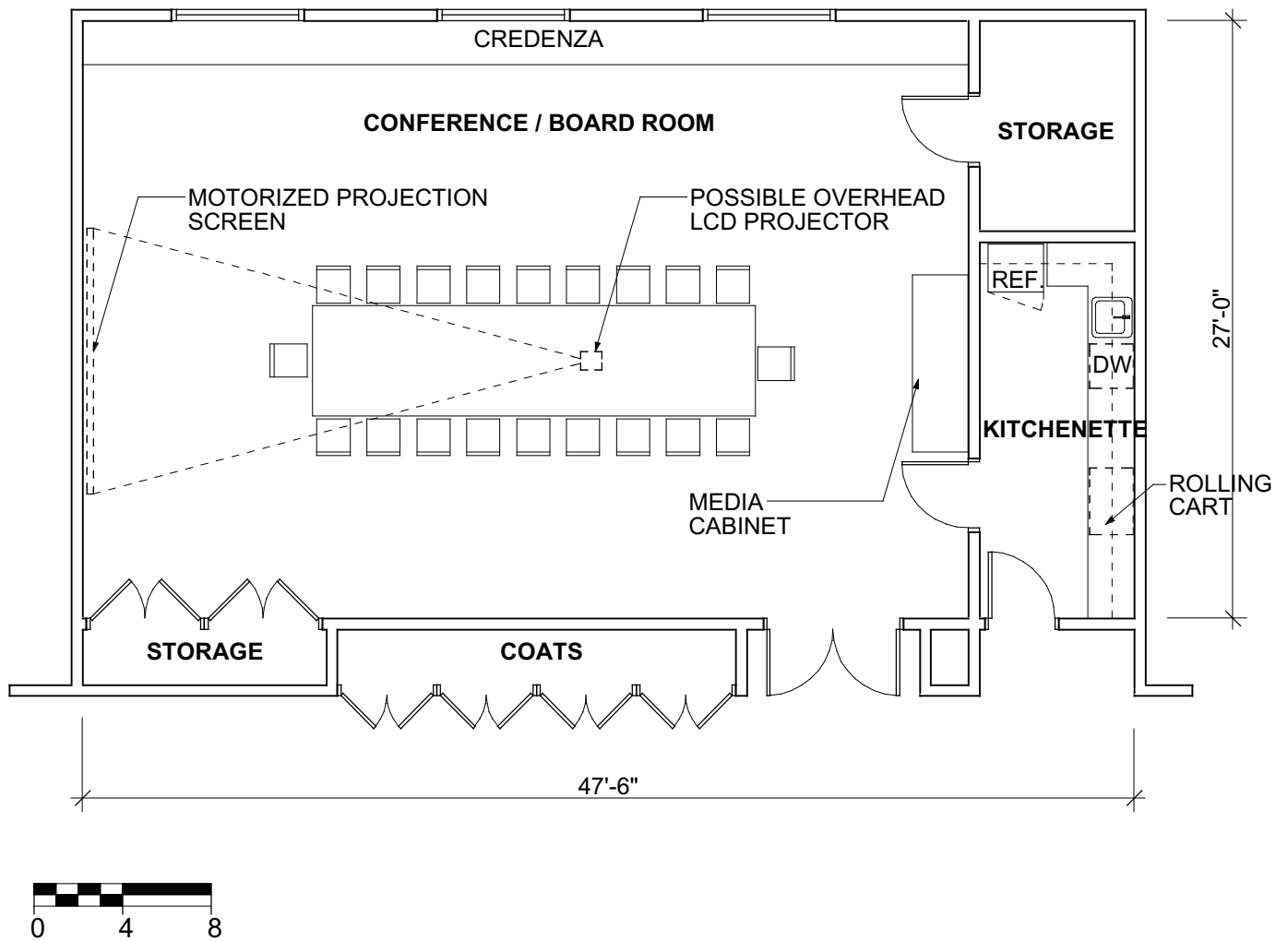
Phone/Data: Telephone, network and A/V connections below table, at perimeter walls, and overhead as required by final A/V - IT design.

Other:

Furnishings and Equipment: Large conference table that can be split into smaller tables. Seating for 20 at table with additional seats at perimeter. Smart white boards, roll-down projector screen (electric). Extensive A/V anticipated (potentially video conferencing.) Tackable walls with display rails at perimeter. Ceiling mounted LCD projector.

Notes: Coordinate final design with A/V requirements and equipment. Walls to allow for changing wall hangings easily.

Prototype Plan:



Notes:

4.1.1.2 Board Suite Kitchenette

5.3.4 Staff Work Areas

Description

Function: Small kitchenette to serve Board Suite primarily and Administrative Work Areas, secondarily.

Capacity: --

Net Area: 100 nsf.

Adjacency/Access

Adjacent to: Conference/Board Room, Administrative/Reception Suite.

Access to: Other Administrative Work Areas, Lobby, Service Elevator.

Design Criteria

Architectural

Character: Clean, efficient, minimal, but consistent with Board Suite.

Openings: One 3' door to Conference/Board Room, one 3' door for service access.

Ceiling Height/Materials: 9' height / Acoustic ceiling tile.

Walls: Epoxy-painted gypsum board.

Floors: Resilient flooring.

Other: Plastic laminate cabinets and counters.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment E (see Mechanical Section 4.3.3).

Lighting: Fluorescent lighting with occupant sensors) on top of upper cabinets.

Power: 120 v. convenience outlets above counters and as required for appliances.

Plumbing: Sink, dishwasher, ice maker in refrigerator.

Security: University standard.

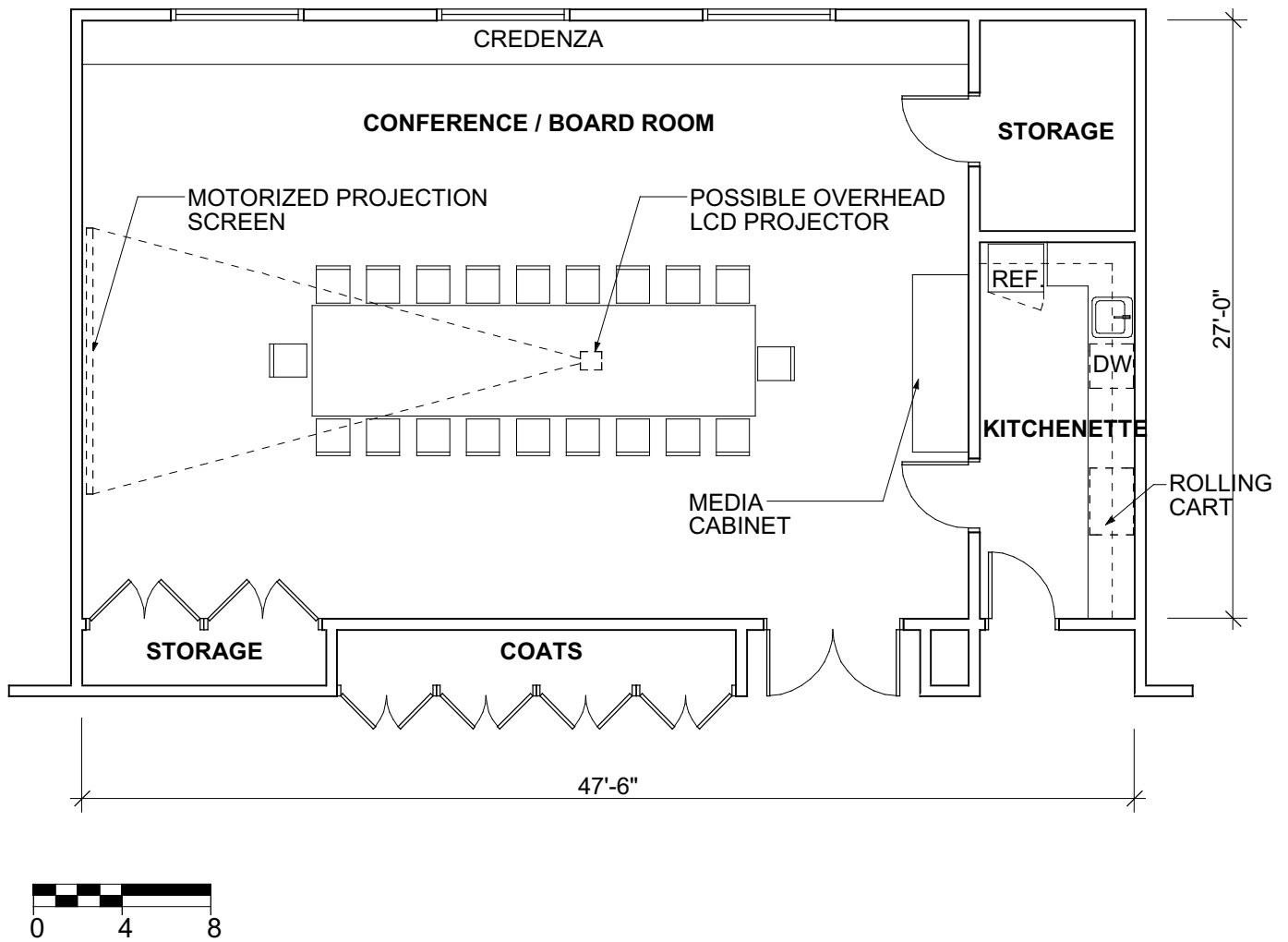
Phone/Data: N/A

Other:

Furnishings and Equipment: Appliances: Refrigerator/freezer, stove, dishwasher, microwave oven. Upper and lower cabinets maximizing storage efficiency. Rolling service cart to fit under counter.

Notes:

Prototype Plan:



Notes:

4.1.1.3 Board Suite Storage

5.3.4 Staff Work Areas

Description

Function: Chair and equipment storage for Conference/Board Room.

Capacity: --

Net Area: 50 nsf.

Adjacency/Access

Adjacent to: Conference/Board Room.

Access to: Administrative Work Areas.

Design Criteria

Architectural

Character: Simple, clean, efficient, secure.

Openings: Single 3' access door.

Ceiling Height/Materials: 9' minimum height / Accessible acoustic ceiling tile.

Walls: Durable wood and painted gypsum board surfaces.

Floors: Carpet.

Other: Wood shelving

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Recessed fluorescent downlights with occupant sensors.

Power: Code standard.

Plumbing: N/A

Security: University standard.

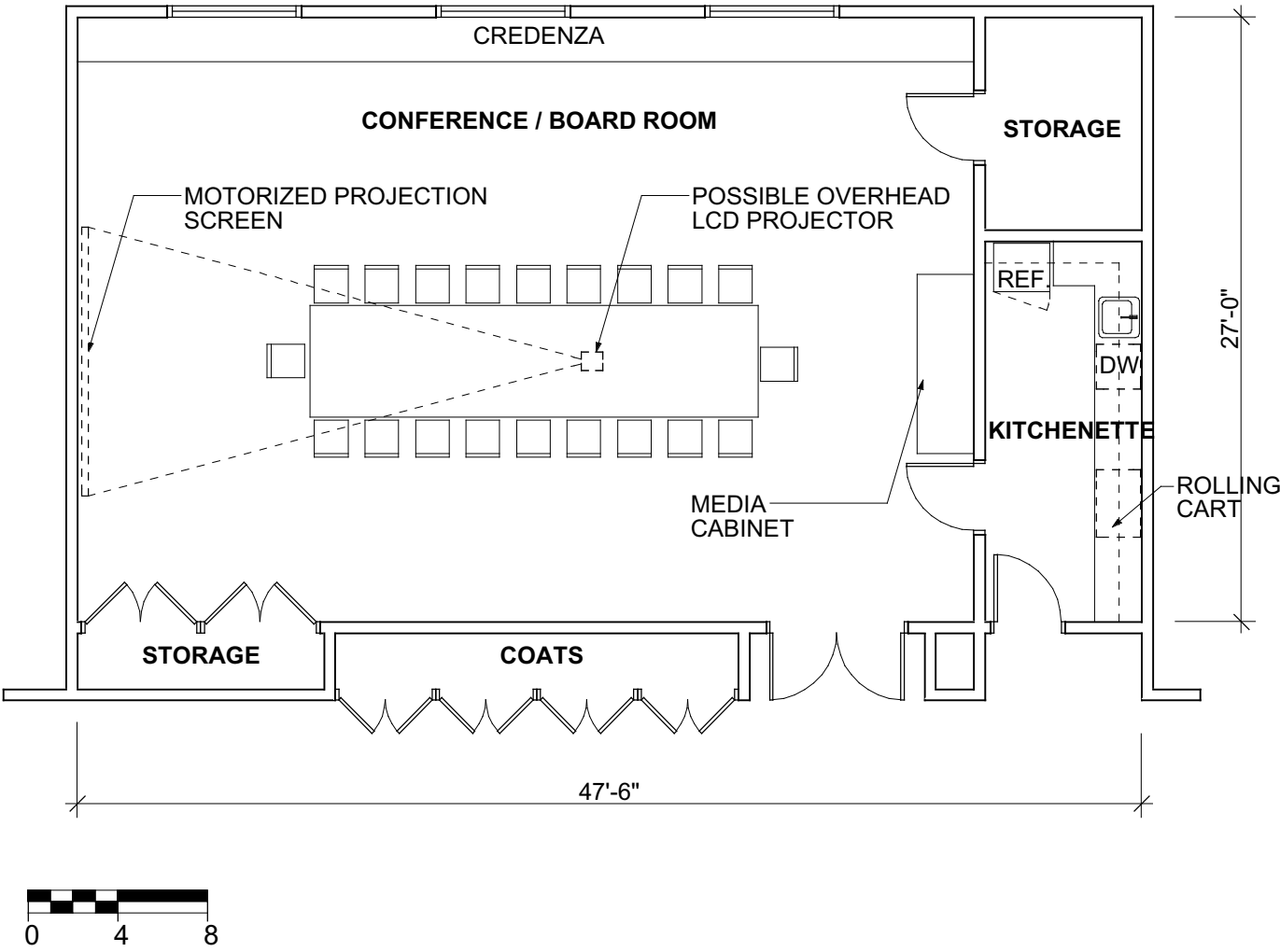
Phone/Data: N/A

Other:

Furnishings and Equipment: High quality stackable chairs on trucks.

Notes:

Prototype Plan:



Notes:

4.1.1.4 Board Suite Coat Closet

5.3.4 Staff Work Areas

Description

Function: Coat closet for Conference/Board Room.

Capacity: --

Net Area: 50 nsf.

Adjacency/Access

Adjacent to: Conference/Board Room.

Access to: Administrative Work Areas.

Design Criteria

Architectural

Character: Simple, clean, efficient, secure.

Openings: Four sets of double 3' doors.

Ceiling Height/Materials: 8' minimum height / Accessible acoustic ceiling tile.

Walls: Durable wood and painted gypsum board surfaces.

Floors: Carpet.

Other: Built-in wood shelf.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: N/A

Lighting: N/A

Power: Code Standard.

Plumbing: N/A

Security: University standard.

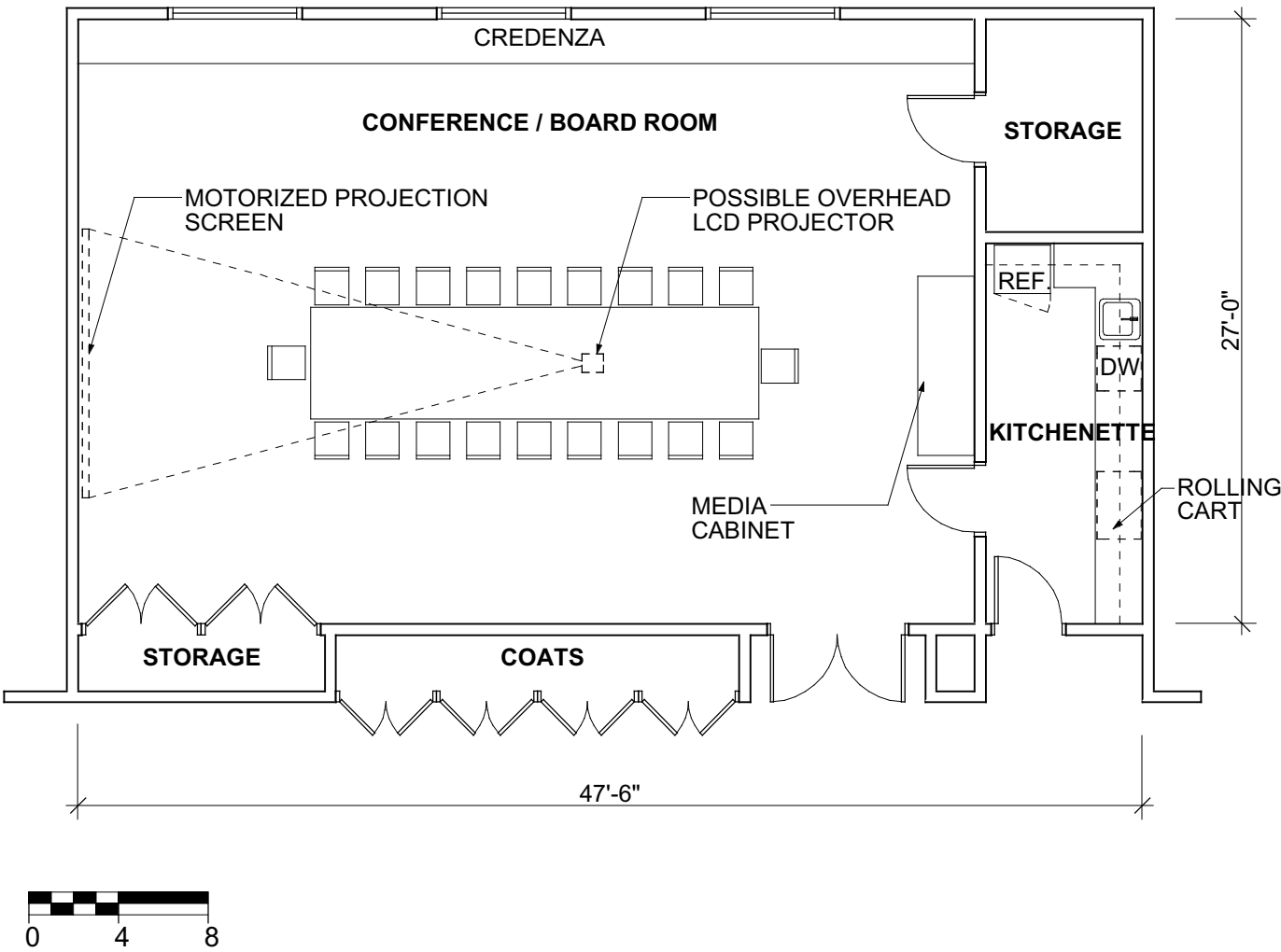
Phone/Data: N/A

Other:

Furnishings and Equipment: Built-in hanger rod.

Notes:

Prototype Plan:



Notes:

4.1.2.1 Director's Office

5.3.4 Staff Work Areas

Description

Function: Private office for Museum's Director.

Capacity: 1 person.

Net Area: 200 nsf.

Adjacency/Access

Adjacent to: Director's Conference, Administrative Assistant, Reception/Waiting Area, Board Suite.

Access to: Other Administrative Work Areas, Copy Room, Lobby, 5.3.2 Public Program Spaces.

Design Criteria

Architectural

Character: Friendly, accessible, dignified, reflecting the unique personality of the Museum/the Director.

Openings: Sound sealed 3' doors to Director's Conference and Administrative Assistant/Reception/
Waiting Area. Windows to natural light and view.

Ceiling Height/Materials: 12' preferred height / Acoustic ceiling tile.

Walls: Natural wood, painted gypsum board.

Floors: Carpet.

Other: Designed as a suite with other Administrative/Reception spaces.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment C (see Mechanical Section 4.3.3).

Lighting: Indirect ambient with occupant sensors. Direct task lighting and perimeter track.

Power: 120 v. convenience outlets at walls and below desk.

Plumbing: N/A

Security: University standard.

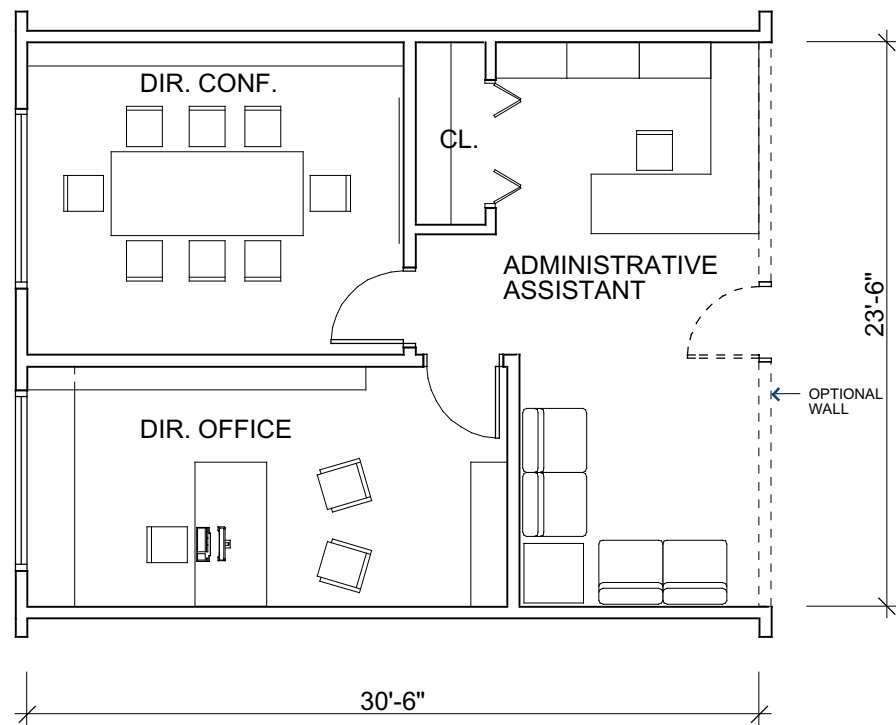
Phone Data: Telephone and network connections at one wall and below desk.

Other:

Furnishings and Equipment: Executive desk chair and credenza. File cabinets, bookshelves, two guest chairs. Desktop computer and monitor.

Notes: One option to consider in the design phase is eliminating the wall between the Director's Office and the Director's Conference (4.1.2.1 and 4.1.2.2).

Prototype Plan:



Notes:

4.1.2.2 Director's Conference

5.3.4 Staff Work Areas

Description

Function: Private conference room for the Museum's Director.

Capacity: 8 people.

Net Area: 200 nsf.

Adjacency/Access

Adjacent to: Director's Office, Administrative Assistant/Reception/Waiting Area.

Access to: Board Suite, other Administrative Work Areas, Lobby, Kitchenette.

Design Criteria

Architectural

Character: Consistent with Director's Office.

Openings: Sound sealed 3' door(s) to Director's Office and Reception Area. Windows to natural light and views.

Ceiling Height/Materials: 12' height preferred / Acoustic ceiling tile.

Walls: Natural wood, painted gypsum board.

Floors: Carpet.

Other: Designed as a suite with other Administrative/Reception spaces. Occasionally private meals will be served in this room.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment C (see Mechanical Section 4.3.3).

Lighting: Indirect ambient with occupant sensors. Direct task lighting and perimeter track.

Power: 120 v. convenience outlets at walls and below desk.

Plumbing: N/A

Security: University standard.

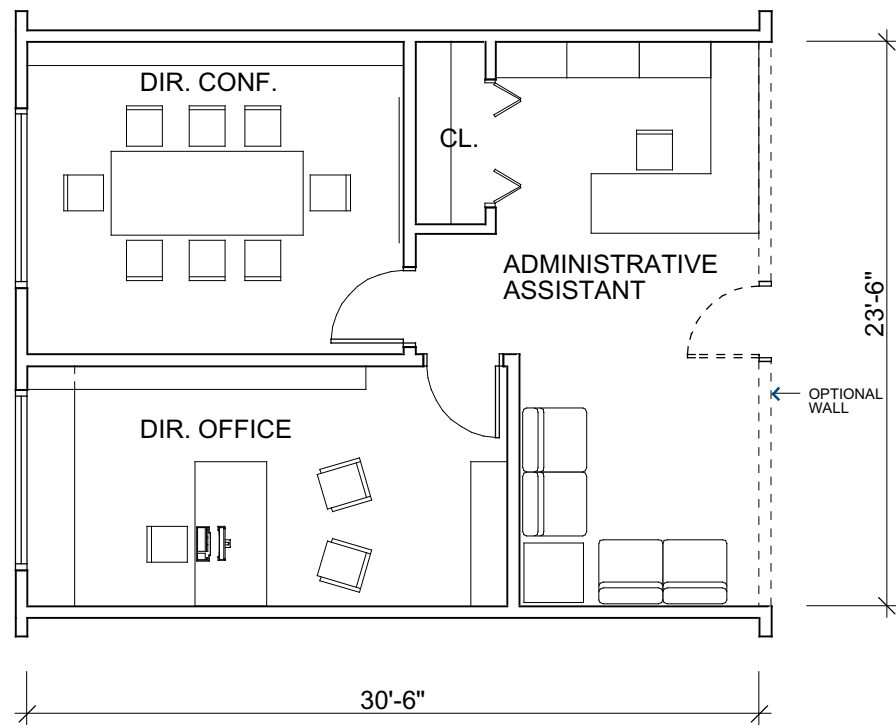
Phone/Data: Telephone and network connections at one wall and below desk. Room may also have extensive A/V capability; potentially including LCD projector, flat screen plasma monitor with various playback media capabilities, and video conferencing.

Other:

Furnishings and Equipment: Table and chairs for 8. Bookshelves as desired. Service console or credenza for meals/refreshments. Media console or cabinet as needed.

Notes:

Prototype Plan:



Notes:

4.1.2.3 Administrative Assistant/Reception

5.3.4 Staff Work Areas

Description

Function: Reception area for guests to the Museum's administrative offices and work space for administrative assistant.

Capacity: One staff, four visitors.

Net Area: 250 nsf.

Adjacency/Access

Adjacent to: Director's Office, Director's Conference, Board Suite.

Access to: Other Administrative Work Areas, Lobby, Kitchenette.

Design Criteria

Architectural

Character: Consistent with Director's Office.

Openings: Sound sealed 3' doors to Director's Conference and Administrative Assistant/Reception/Waiting Area. Windows to natural light and view.

Ceiling Height/Materials: 12' preferred height / Acoustic ceiling tile.

Walls: Natural wood, painted gypsum board.

Floors: Carpet.

Other: Designed as a suite with other Administrative/Reception spaces.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Indirect ambient with occupant sensors. Direct task lighting and perimeter track.

Power: 120 v. convenience outlets at walls and below desk.

Plumbing: N/A

Security: University standard.

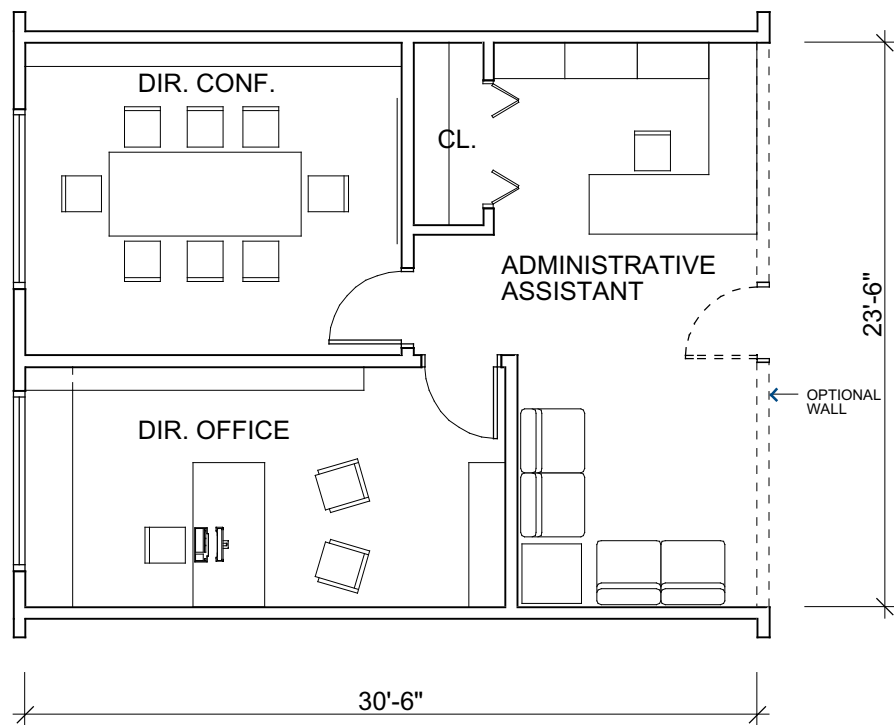
Phone/Data: Two telephone and network connections at work station.

Other:

Furnishings and Equipment: Task desk with return and task seating. Two desktop computers. One guest settee, 2 guest chairs. Files, low bookshelves as needed. Miscellaneous business machines.

Notes:

Prototype Plan:



Notes:

4.1.2.4 Administrative Closet

5.3.4 Staff Work Areas

Description

Function: Coat closet and minimal storage room for Director's Suite.

Capacity: --

Net Area: 20 nsf.

Adjacency/Access

Adjacent to: Administrative Assistant/Reception/Waiting Area.

Access to: Director's Office, Director's Conference.

Design Criteria

Architectural

Character: Simple, clean, efficient, secure.

Openings: Double 30" doors.

Ceiling Height/Materials: 8' minimum height / Accessible acoustic ceiling tile.

Walls: Durable wood and painted gypsum board.

Floors: Carpet.

Other: Built-in shelf.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: N/A

Lighting: N/A

Power: Code standard.

Plumbing: N/A

Security: University standard.

Phone/Data: N/A

Other:

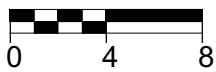
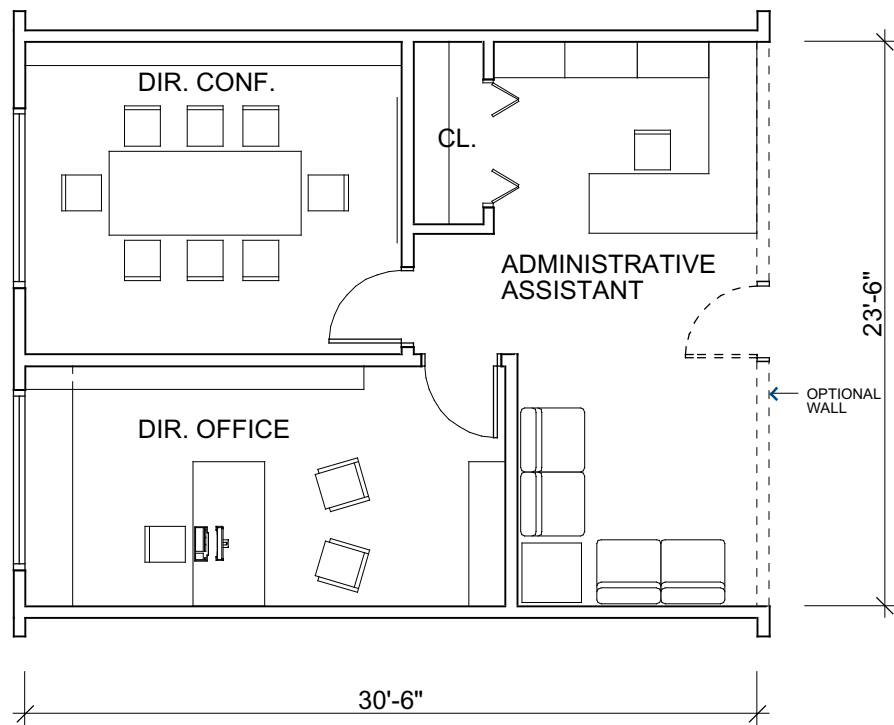
Furnishings and Equipment: Built-in hanger rod.

Notes: Ceiling of this space can be used as an access point to above ceiling equipment

5.3.4 Staff Work Areas

4.1.2.4 Administrative Closet

Prototype Plan:



Notes:

4.1.2.5 Staff Work Area Reception

5.3.4 Staff Work Areas

Description

Function: Reception area for 5.3.4 Staff Work Areas.

Capacity: 1 + 2 guests.

Net Area: 100 nsf.

Adjacency/Access

Adjacent to: Circulation spine for 5.3.4 Staff Work Areas.

Access to: Staff Entry, Lobby, 5.3.2 Public Program Spaces.

Design Criteria

Architectural

Character: Friendly, accessible, dignified.

Openings: Opening to circulation from Lobby and Staff Entry. Opening to circulation to 5.3.4 Staff Work Areas.

Ceiling Height/Materials: 12' preferred height / Acoustic ceiling tile.

Walls: Natural wood, painted gypsum board.

Floors: Carpet.

Other:

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Indirect ambient with occupant sensors. Direct tasklighting and perimeter track.

Power: 120 v. convenience outlets at walls and below desk.

Plumbing: N/A

Security: University standard.

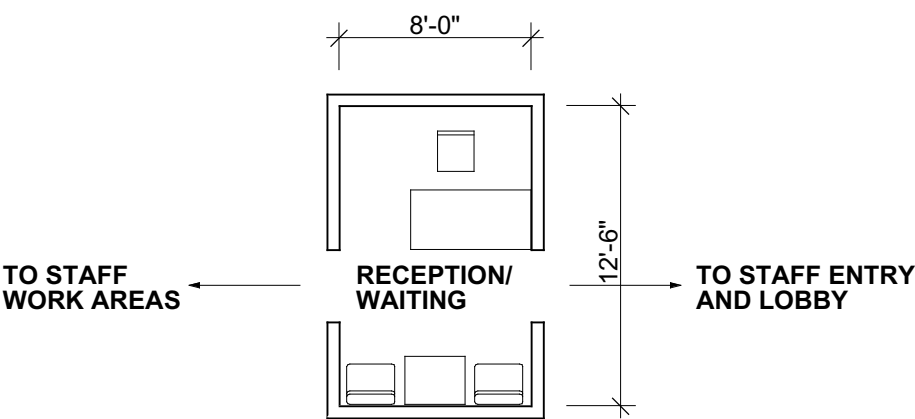
Phone Data: Network connections at one wall and below desk.

Other:

Furnishings and Equipment: Reception desk chair and two lounge chairs and coffee table. Desktop computer and monitor.

Notes:

Prototype Plan:



Notes:

4.1.3 Large Office Suites

5.3.4 Staff Work Areas

Description

Function: Typical for four large office suites serving Community Relations, Development, Education and Exhibits; comprised of Large Office (180 nsf), Small Office (100 nsf), shared workspace for four (340 nsf) and storage (100 nsf)

Capacity: Six staff per suite.

Net Area: 4 suites @ 720 nsf = 2880 nsf.

Adjacency/Access

Adjacent to: Other Administrative Work Areas, Board Suite.

Access to: Exhibit Department (Exhibit Suite), 5.3.2 Public Program Spaces, 5.3.3 Research and Collections area (Exhibit and Education Suites).

Design Criteria

Architectural

Character: Pleasant, comfortable, efficient, contemporary.

Openings: Views and natural light wherever possible. 3' access doors on private offices.

Ceiling Height/Materials: 12' preferred height / Acoustic ceiling tile.

Walls: Wood trim, painted gypsum board.

Floors: Carpet.

Other: White board in each office and workstation.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Indirect ambient with occupant sensors. Direct task lighting.

Power: 110 v. outlets at walls and below desks.

Plumbing: N/A

Security: University standard.

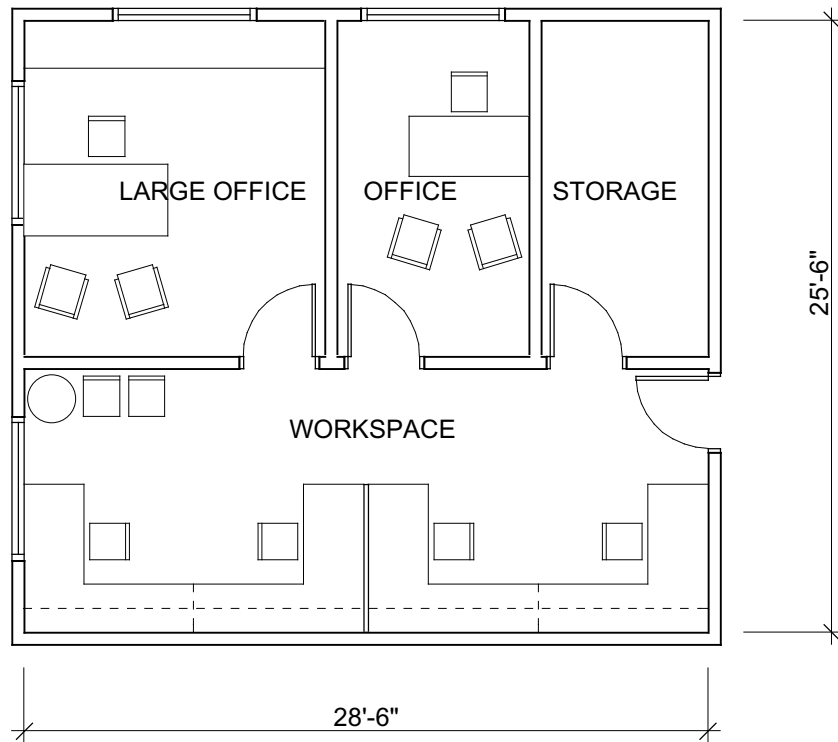
Phone/Data: Two telephone and network connections per workstation.

Other:

Furnishings and Equipment: Manager and staff level desks, work surfaces, chairs, and credenzas. Drafting table (in one suite's large office). At least one desktop computer and monitor at each work station or office. Two guest chairs in offices and open area. Files and bookshelves. Storage rooms fitted out for coats and supplies.

Notes: These suites will require an internal circulation factor of 25%.

Prototype Plan:



Notes:

4.1.4 Small Office Suites

5.3.4 Staff Work Areas

Description

Function: Typical for three office suites serving Education, Operations/Accounting, and Graphic Design; comprised of Office (130 nsf), shared work area for six (450 nsf), and storage (100 nsf).

Capacity: Seven staff per suite.

Net Area: 3 suites @ 680 nsf = 2040 nsf.

Adjacency/Access

Adjacent to: Other Administrative Areas, Board Suite.

Access to: Exhibit Department, Shared Areas, 5.3.2 Public Program Spaces.

Design Criteria

Architectural

Character: Pleasant, comfortable, efficient, contemporary.

Openings: Views and natural light whenever possible. 3' access doors on private offices.

Ceiling Height/Materials: 12' preferred height / Acoustic ceiling tile.

Walls: Wood trim, painted gypsum board.

Floors: Carpet.

Other: White board in each office and workstation.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Indirect ambient with occupant sensors. Direct task lighting.

Power: 120 v. outlets at walls and below desks.

Plumbing: N/A

Security: University standard.

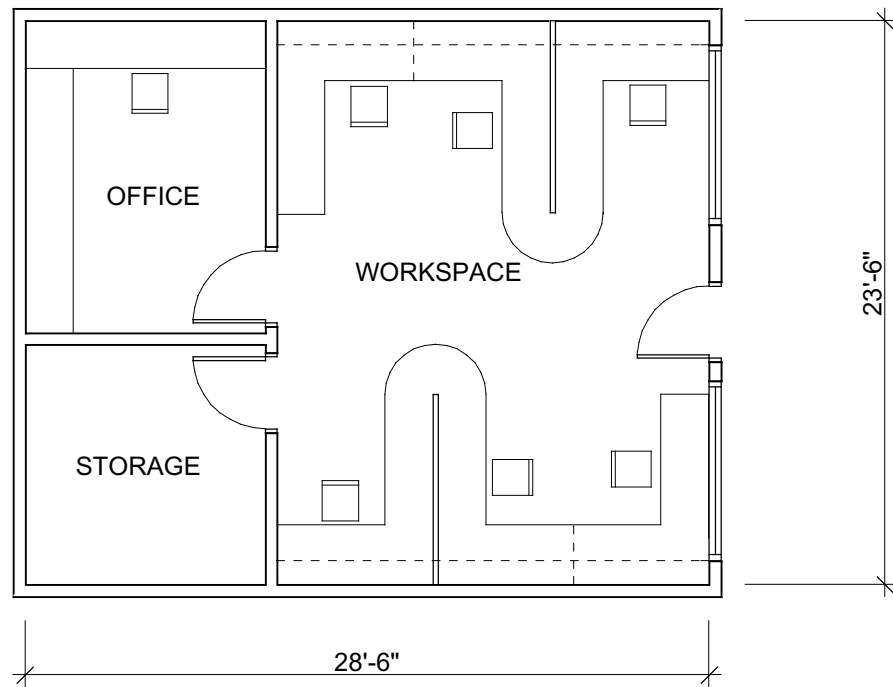
Phone/Data: Two telephone and network connections per workstation.

Other:

Furnishings and Equipment: Manager and staff level desks, work surfaces, chairs, and credenzas. Drafting table (in one suite's office). At least one desktop computer and monitor at each work station or office. Two guest chairs in office. Files and bookshelves. Storage rooms fitted out for coats and supplies.

Notes: These suites will require an internal circulation factor of 25%.

Prototype Plan:



Notes:

4.1.5 Information Technology

5.3.4 Staff Work Areas

Description

Function: A suite of workspaces for Information Technology staff and their equipment.

Comprised of one office (130 nsf), one shared workspace for five (500 nsf), one storage and set-up space (100 nsf), one server room (150 nsf), and one A/V Room (200 nsf).

Capacity: Six staff.

Net Area: 1080 nsf.

Adjacency/Access

Adjacent to: Other Administration Work Areas, IT network hub.

Access to: 5.3.2 Public Program Spaces, Loading Dock (or Freight Elevator).

Design Criteria

Architectural

Character: Pleasant, comfortable, efficient, contemporary.

Openings: No windows. Central to building. 3' access doors on private offices.

Ceiling Height/Materials: 12' preferred height / Acoustic ceiling tile.

Walls: Wood trim, painted gypsum board.

Floors: Resilient flooring.

Other: White board in each office and workstation plus one shared smartboard.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D with additional cooling and ventilation for high equipment loads (see Mechanical Section 4.3.3).

Lighting: Indirect ambient with occupant sensors. Direct task lighting.

Power: Extensive use of 120 v. quad outlets and plug moulding.

Plumbing: N/A

Security: Low Security (see Electrical Section 4.3.6).

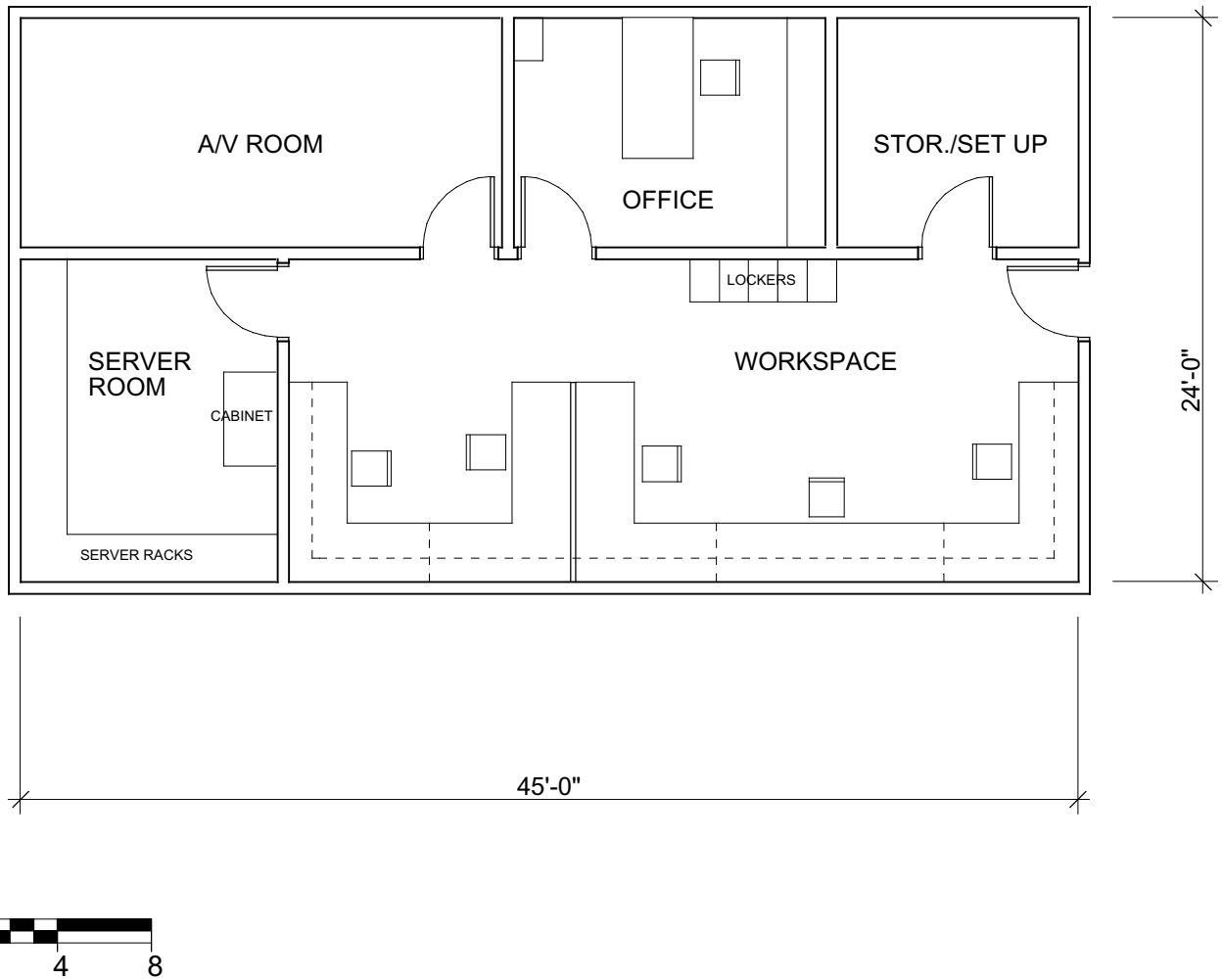
Phone/Data: Two telephone and network connections per workstation.

Other: Gas Suppression System - Inergen.

Furnishings and Equipment: Manager and staff level desks, work surfaces, chairs, and credenzas. At least one desktop computer and monitor at each work station or office. Two guest chairs in offices. Files and bookshelves. Storage rooms fitted out for coats, supplies, and set-up space. Lockers for work study and interns.

Notes: These suites will require an internal circulation factor of 25%. Locate IT and telephone wiring and equipment room (tele-data) directly adjacent to IT office space (150 sf).

Prototype Plan:



Notes:

4.1.6.1 Intern / Work Study Shared Office Space

5.3.4 Staff Work Areas

Description

Function: Typical for two open office work areas for interns, workstudy students, part-time, and contract workers.

Capacity: Five staff each.

Net Area: 2 @ 400 nsf each = 800 nsf.

Adjacency/Access

Adjacent to: Other Administrative Work Areas and shared spaces.

Access to: 5.3.2 Public Program Spaces, Staff Lounge.

Design Criteria

Architectural

Character: Friendly, collegial, collaborative.

Openings: Could be open to corridor or an open space surrounded by enclosed areas.

Ceiling Height/Materials: 12' preferred height / Acoustic ceiling tile.

Walls: Wood trim, painted gypsum board.

Floors: Carpet.

Other:

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Indirect ambient with occupant sensors. Direct task lighting.

Power: 110 v. outlets at walls and below desks.

Plumbing: N/A

Security: University standard.

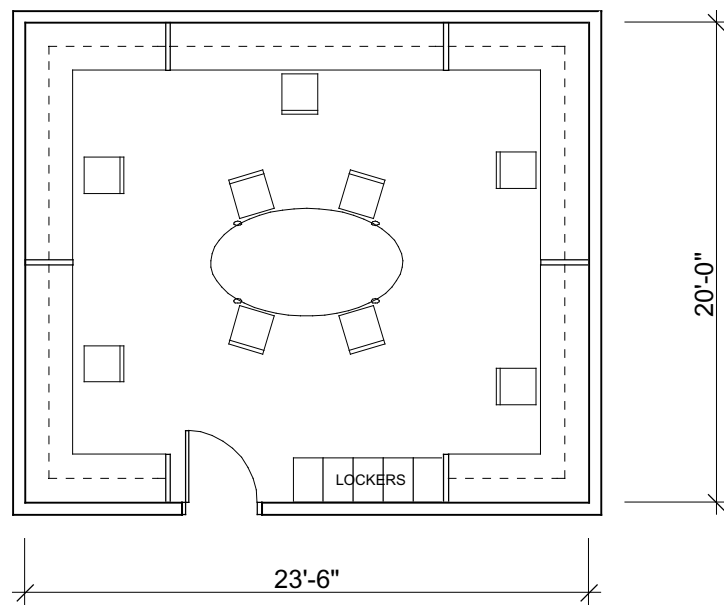
Phone/Data: Two telephone and network connections per workstation.

Other:

Furnishings and Equipment: Staff level work surfaces, chairs, and partitions. At least one desktop computer and monitor at each work station. Shared central work table. Files and bookshelves. Lockers for storage of coats and personal items.

Notes: These suites will require an internal circulation factor of 25%.

Prototype Plan:



Notes:

4.1.7 Education / Community Relations Storage

5.3.4 Staff Work Areas

Description

Function: Storage for educational materials, teacher toolkits, outreach kits, banners, Community Relations supplies, field adventure tent and table.

Capacity: --

Net Area: 500 nsf.

Adjacency/Access

Adjacent to: 5.3.4 Staff Work Areas.

Access to: Classrooms.

Design Criteria

Architectural

Character: Simple, clean, efficient, secure.

Openings: Single 3' access door.

Ceiling Height/Materials: 9' minimum height / Accessible acoustic ceiling tile.

Walls: Durable wood and painted gypsum board surfaces.

Floors: Seamless resilient flooring.

Other:

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Recessed fluorescent downlights.

Power: Code standard.

Plumbing: N/A

Security: Low Security (see Electrical Section 4.3.6).

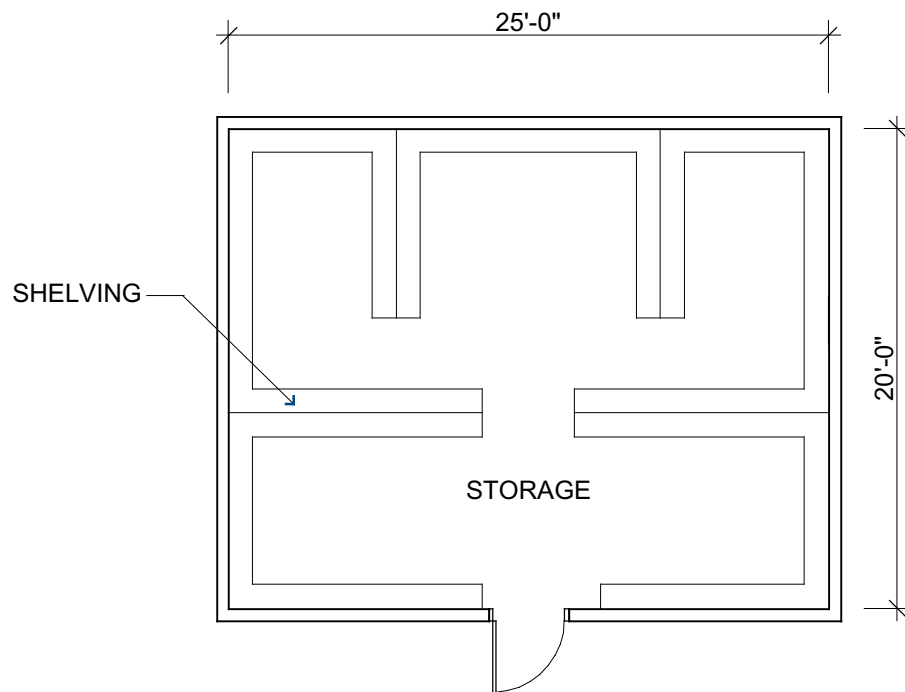
Phone/Data: N/A

Other:

Furnishings and Equipment: Wooden shelving units.

Notes: This room may be subdivided into five sections to enable control of supplies.

Prototype Plan:



Notes:

4.2.1 Technical Shared / Clean Work Space

5.3.4 Staff Work Areas

Description

Function: Quiet work area for exhibit support, preparators, technicians, and prototyper.

Capacity: 6 persons.

Net Area: 450 nsf.

Adjacency/Access

Adjacent to: Technical Clean Work Area, other Exhibit Department areas, Paleo-Casting Lab.

Access to: Exhibits Office Suite, Loading Dock, Freight Elevator.

Design Criteria

Architectural

Character: Friendly, creative, capable, efficient, organized.

Openings: 4' double doors (8' high) or open to Technical Clean Work Area. Natural light and views desirable.

Ceiling Height/Materials: 15 foot minimum height / Painted exposed structure.

Walls: Painted gypsum board. Wood trim. Durable surfaces.

Floors: Resilient flooring.

Other:

Systems

Structural: Building Standard (see Structural Section 4.3.2). 150 psf floor loading. Forklift loads.

Mechanical: Environment C (see Mechanical Section 4.3.3).

Lighting: Indirect fluorescent with occupant sensors, direct task lighting.

Power: 120 v. outlets below workstations at floor in center. 110 v. plug mould above workbench.

Plumbing: N/A

Security: Low Security (see Electrical Section 4.3.6).

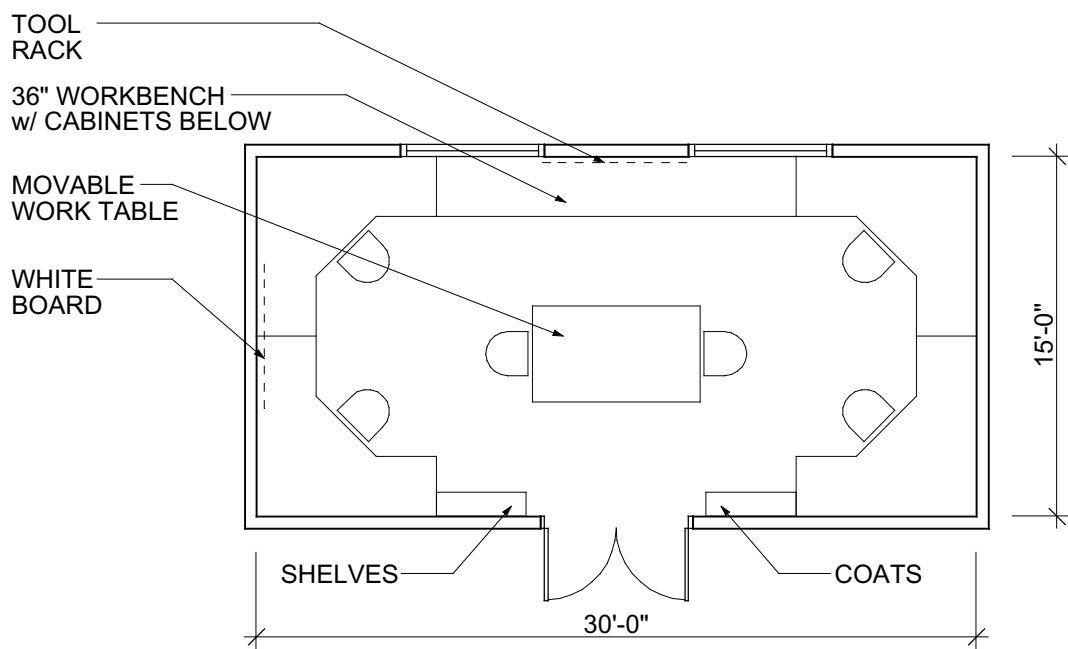
Phone/Data: Two telephone and network connections per workstation.

Other:

Furnishings and Equipment: Four computer stations. Workbench with cabinets below, tool rack above. Smart white board. Large mobile table. Six durable task chairs.

Notes: Combine with 4.2.1.2 to maximize usable space.

Prototype Plan:



Notes: Also refer to 4.2.1.2.

4.2.2.1 Carpentry Shop

5.3.4 Staff Work Areas

Description

Function: Workshop for fabricating exhibitry components.

Capacity: --

Net Area: 2000 nsf.

Adjacency/Access

Adjacent to: Carpentry Storage, Tool Storage, Hardware Storage, Technical Shared Work Space.

Access to: Other Exhibit Department areas, Loading Dock, Freight Elevator, Exhibit Office Suite,
Emergency Eyewash and Shower.

Design Criteria

Architectural

Character: Efficient, organized, safe.

Openings: 4' double doors (8' high) to service corridor. Window light desired.

Ceiling Height/Materials: 12' height minimum / Acoustic treatment on painted gypsum board.

Walls: Epoxy painted filled cmu walls.

Floors: Sealed concrete floors.

Other:

Systems

Structural: Building Standard (see Structural Section 4.3.2). 150 psf floor loading. Forklift loading.

Mechanical: Environment E (see Mechanical Section 4.3.3).

Lighting: Indirect fluorescent for ambient. Task lighting at each tool.

Power: As required for equipment list (see note on next page). Pull-down powercords (4 locations).
650 amp services requested.

Plumbing: Compressed air provided by local or central compressor.

Security: Low Security (see Electrical Section 4.3.6).

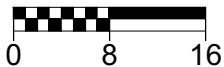
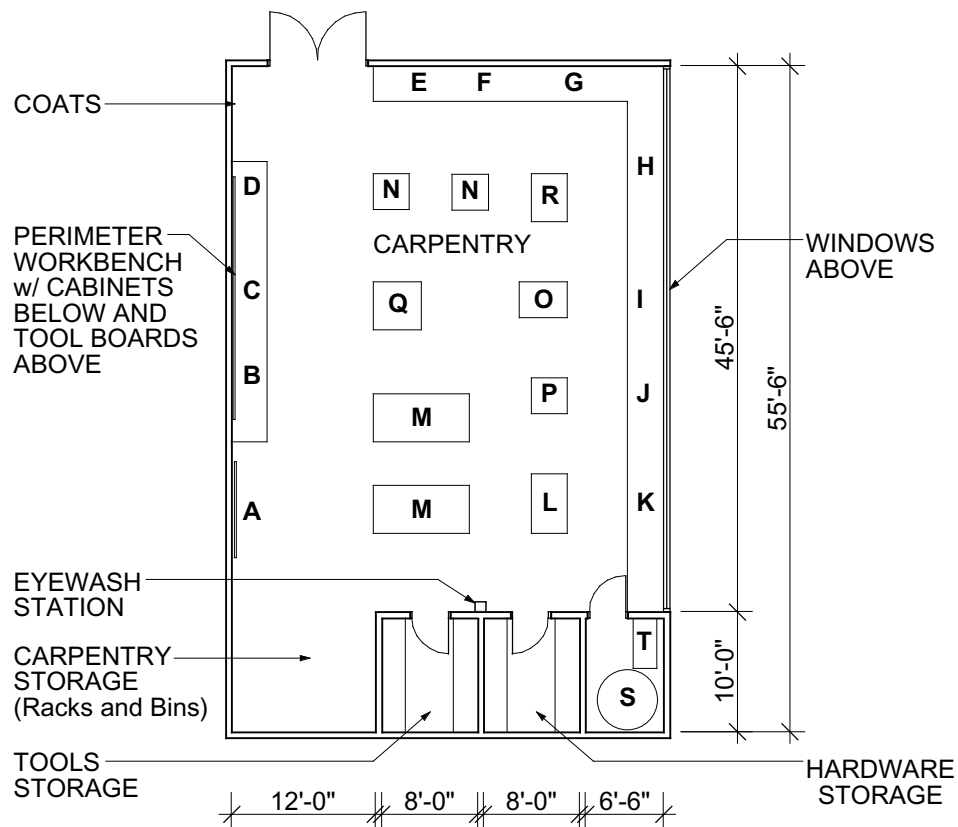
Phone/Data: Telephone and network connections.

Other: Central dust collection system.

Furnishings and Equipment: Emergency eyewash station.

Notes:

Prototype Plan:



Notes: Key to equipment above:

- | | |
|--------------------------------------|---|
| A Panel Saw | L 20" Planer |
| B 12" Compound Miter Saw | M Mobile Work Tables |
| C 10" Radial Arm Saw | N Router Table |
| D 14" Bandsaw | O Shaper |
| E/F 21" Drill Press | P Spindle Sander |
| G 16" Longbed Wood Lathe | Q 1" Delta Table Saw (Unisaw w/ 50" Biesmeyer fence system) |
| H Hollow Chisel Motiser | R 8" Jointer |
| I Sanding Station (6" Belt/12" Disk) | S Dust Collection System |
| J 26" Drum Sander | T Compressor, 10 cfm @ 90 psz |
| K Sharpening Station | |

4.2.2.2 Tool Storage

5.3.4 Staff Work Areas

Description

Function: Storage room for power tools, hand tools, consumable parts.

Capacity: --

Net Area: 75 nsf.

Adjacency/Access

Adjacent to: Carpentry Shop.

Access to: Other Exhibit Department Areas.

Design Criteria

Architectural

Character: Simple, clean, efficient, secure.

Openings: Single 3' access door.

Ceiling Height/Materials: 8' minimum height / Accessible acoustic ceiling tile.

Walls: Durable wood and painted gypsum board.

Floors: Sealed concrete floor.

Other:

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Recessed fluorescent downlights with occupant sensors.

Power: Code standard.

Plumbing: N/A

Security: Low security (see Electrical Section 4.3.6).

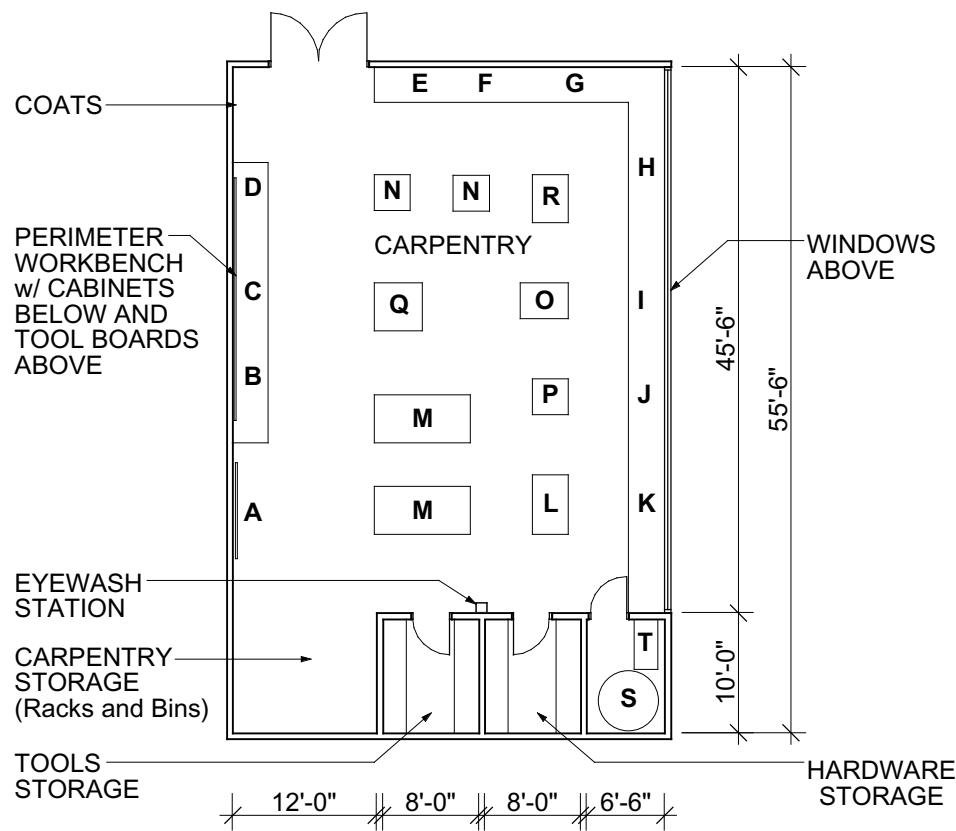
Phone/Data: N/A

Other:

Furnishings and Equipment: Metal shelving units.

Notes:

Prototype Plan:



Notes:

4.2.2.3 Hardware Storage

5.3.4 Staff Work Areas

Description

Function: Storage room for hardware used in exhibit components.

Capacity: --

Net Area: 75 nsf.

Adjacency/Access

Adjacent to: Carpentry Shop.

Access to: Other Exhibit Department Areas.

Design Criteria

Architectural

Character: Simple, clean, efficient, secure.

Openings: Single 3' access door.

Ceiling Height/Materials: 8' minimum height / Accessible acoustic ceiling tile.

Walls: Durable wood and painted gypsum board.

Floors: Sealed concrete floor.

Other:

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Recessed fluorescent downlights with occupancy sensors.

Power: Code standard.

Plumbing: N/A

Security: Low Security (see Electrical Section 4.3.6).

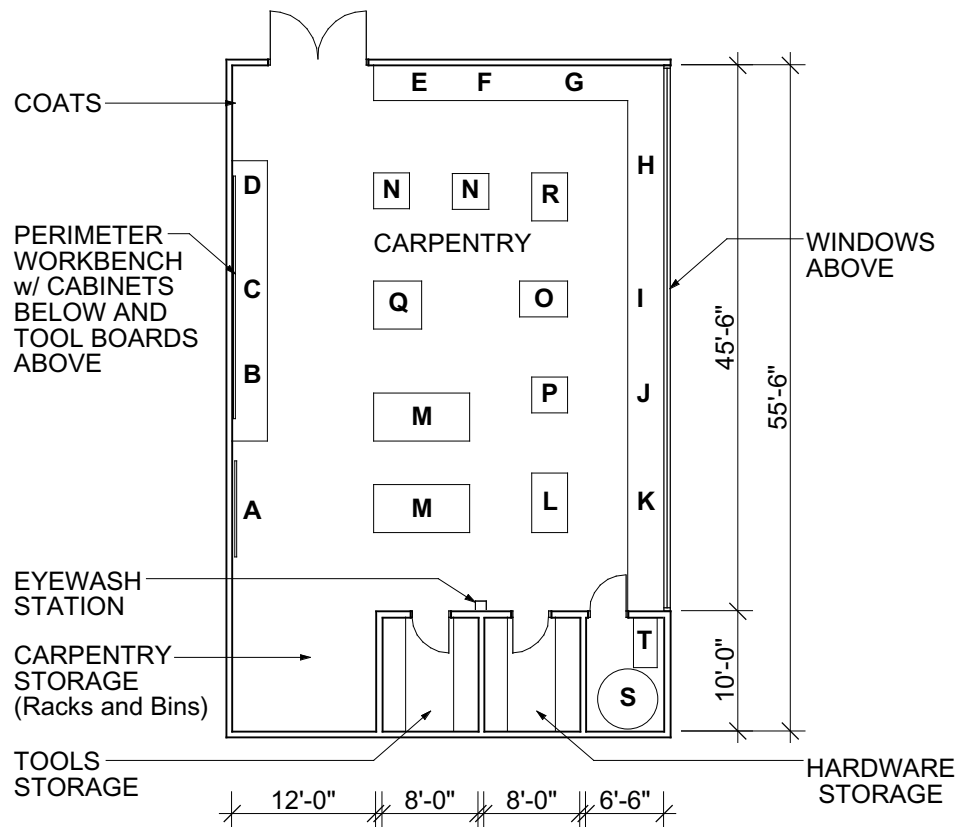
Phone/Data: N/A

Other:

Furnishings and Equipment: Metal shelving units.

Notes:

Prototype Plan:



4.2.2.4 Carpentry Storage

5.3.4 Staff Work Areas

Description

Function: Storage room for large and bulk material.

Capacity: --

Net Area: 120 nsf.

Adjacency/Access

Adjacent to: Carpentry Shop.

Access to: Other Exhibit Department Areas.

Design Criteria

Architectural

Character: Simple, clean, efficient, secure.

Openings: Single 3' access door.

Ceiling Height/Materials: 8' minimum height / Accessible acoustic ceiling tile.

Walls: Durable wood and painted gypsum board.

Floors: Sealed concrete floor.

Other:

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Recessed fluorescent downlights with occupant sensors.

Power: Code standard.

Plumbing: N/A

Security: Low Security (see Electrical Section 4.3.6).

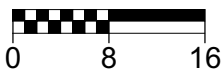
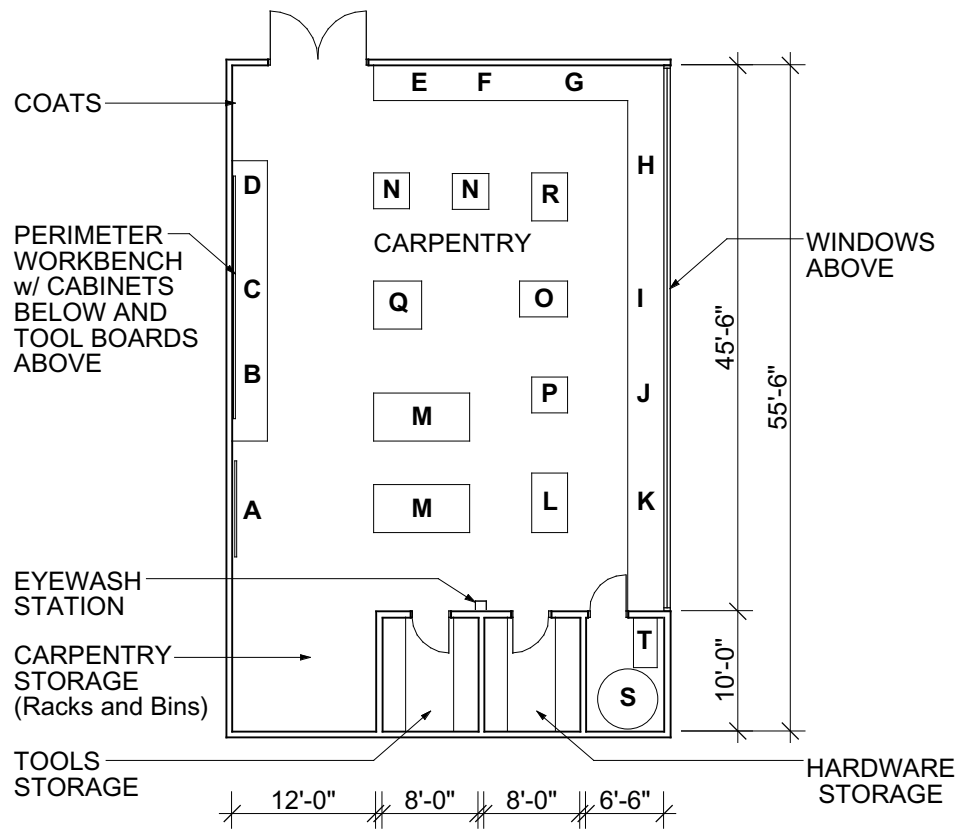
Phone/Data: N/A

Other:

Furnishings and Equipment: Wall-mounted racks for plywood, lumber, sheet plastic, etc.. Metal storage bins. Metal shelving units.

Notes:

Prototype Plan:



Notes:

4.2.3.1 Paint Booth

5.3.4 Staff Work Areas

Description

Function: Area for pre-fabricated paint and spray both.

Capacity: --

Net Area: 120 nsf.

Adjacency/Access

Adjacent to: Paint Booth Exhaust, Set-up/Supplies, Paint Storage.

Access to: Other Exhibit Spaces, Loading Dock, Freight Elevator.

Design Criteria

Architectural

Character: Determined by booth manufacturer.

Openings: Replaceable filter wall to Exhaust Area. Open to Set-up/Supplies.

Ceiling Height/Materials: Height per booth manufacturer's requirements / Sheet steel.

Walls: Sheet steel (painted with strippable film), filters.

Floors: Sealed concrete floor.

Other: Verify fire separation requirements during design phase.

Systems

Structural: Building Standard (see Structural Section 4.3.2). 150 psf floor loading. Forklift loads.

Mechanical: Environment F (see Mechanical Section 4.3.3).

Lighting: Explosion proof as provided by booth manufacturer.

Power: Verify with final selection of booth.

Plumbing: Local or access to central air compressor for paint spray.

Security: Low Security (see Electrical Section 4.3.6).

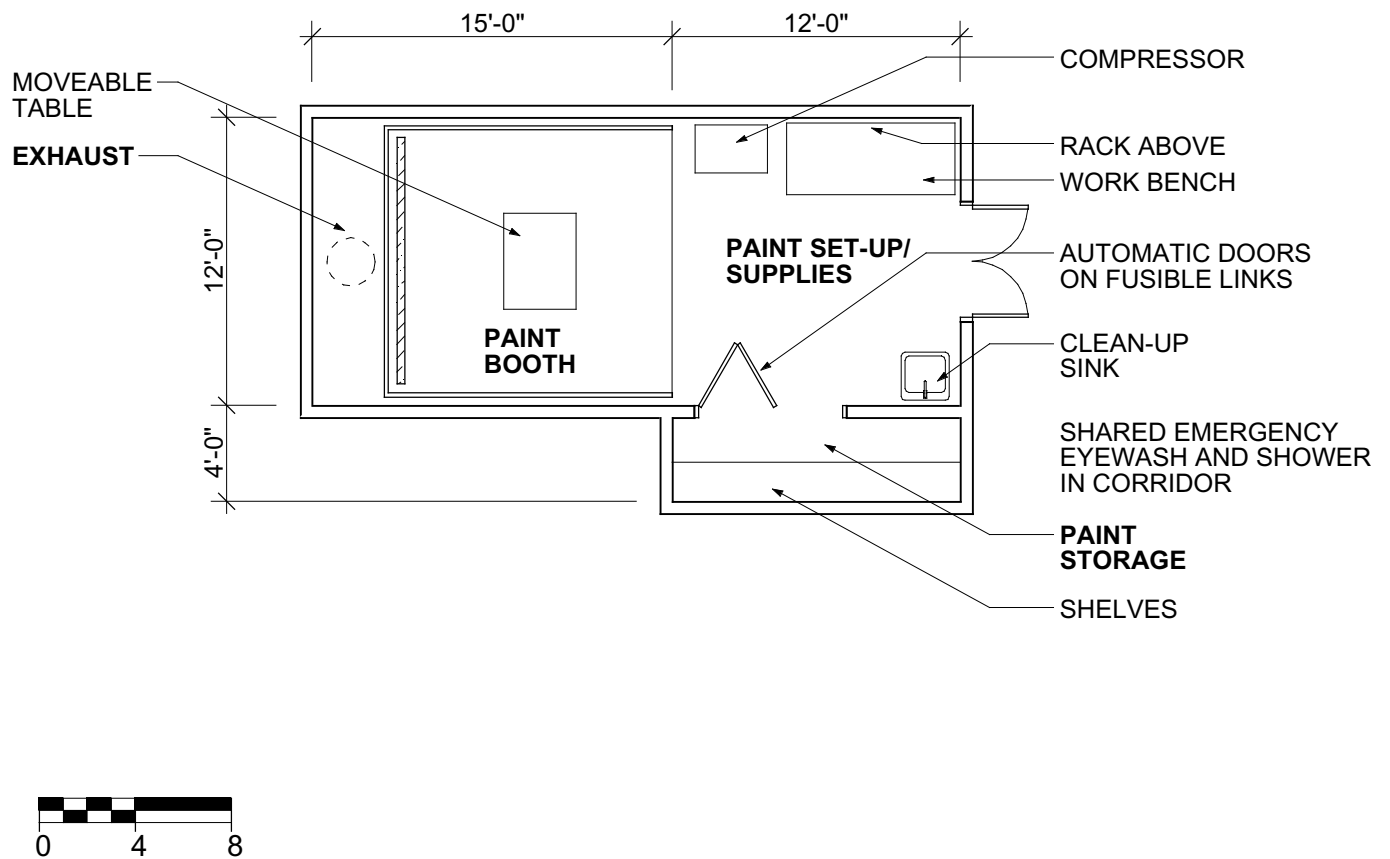
Phone/Data: N/A

Other: Gas Suppression System - Inergen.

Furnishings and Equipment: Pre-fabricated paint spray booth. Mobile work table.

Notes: Verify code requirements for flow-out panels in room walls and/or roof.

Prototype Plan:



Notes: Paint storage will require fire separation from other adjacent spaces depending on type and quantity of materials to be stored. If necessary for hazard control, it may be relocated to the loading dock area and open to outside air provided temperatures in the room are sufficiently high to prevent freezing and maintain workability of materials.

4.2.3.2 Paint Booth Exhaust

5.3.4 Staff Work Areas

Description

Function: Plenum and filter zone for paint booth exhaust.

Capacity: --

Net Area: 40 nsf.

Adjacency/Access

Adjacent to: Paint Spray Booth, exterior wall.

Access to: Set-up/Supplies, Loading Dock, Freight Elevator.

Design Criteria

Architectural

Character: Utility.

Openings: Open to Paint Spray Booth. Other openings as required by final exhaust system design.

Ceiling Height/Materials: Open / Painted exposed structure.

Walls: Painted concrete block or shaft wall.

Floors: Sealed concrete floor.

Other: Verify fire separation requirements during design phase.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment F (see Mechanical Section 4.3.3).

Lighting: Utility lighting: explosion-proof.

Power: Per paint spray booth exhaust system.

Plumbing: N/A

Security: Low Security (see Electrical Section 4.3.6).

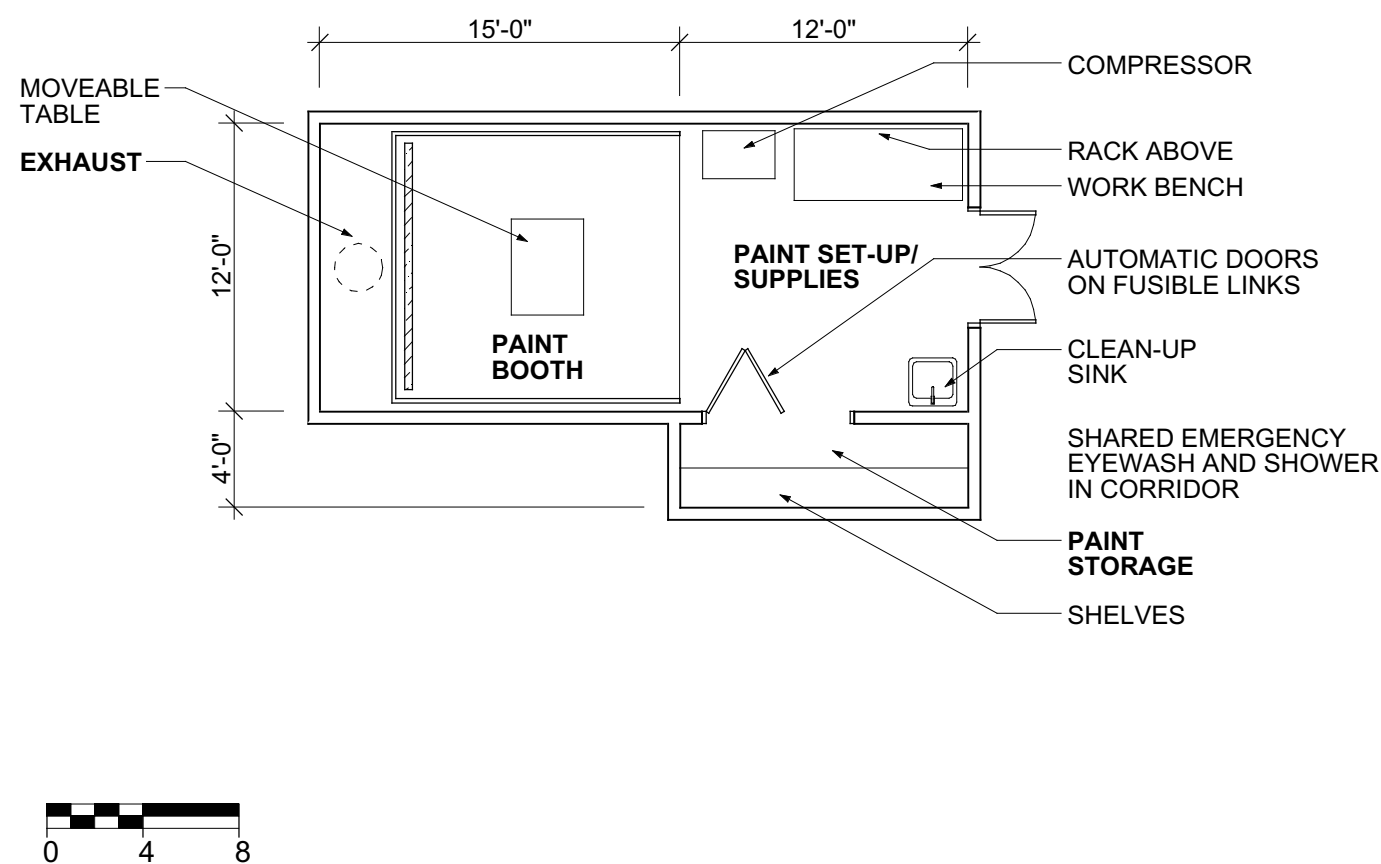
Phone/Data: N/A.

Other: Gas Suppression System - Inergen.

Furnishings and Equipment: Exhaust package for Paint Spray Booth.

Notes: Verify code requirements for blow-out panels in room walls and/or roof.

Prototype Plan:



Notes:

4.2.3.3 Paint Storage

5.3.4 Staff Work Areas

Description

Function: Storage room for materials used in exhibit support painting operations.

Capacity: --

Net Area: 50 nsf.

Adjacency/Access

Adjacent to: Paint Set-up/Supplies (see note on next page).

Access to: Loading Dock, Paint Spray Booth, Emergency Eye Wash and Shower Station.

Design Criteria

Architectural

Character: Utility.

Openings: Automatic closing 3' doors on fusible links.

Ceiling Height/Materials: 8' minimum / Painted concrete.

Walls: Epoxy painted cmu walls.

Floors: Sealed concrete floor.

Other: Verify fire separation requirements during design phase.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment F (see Mechanical Section 4.3.3).

Lighting: Explosion-proof.

Power: N/A

Plumbing: N/A

Security: Low Security (see Electrical Section 4.3.6).

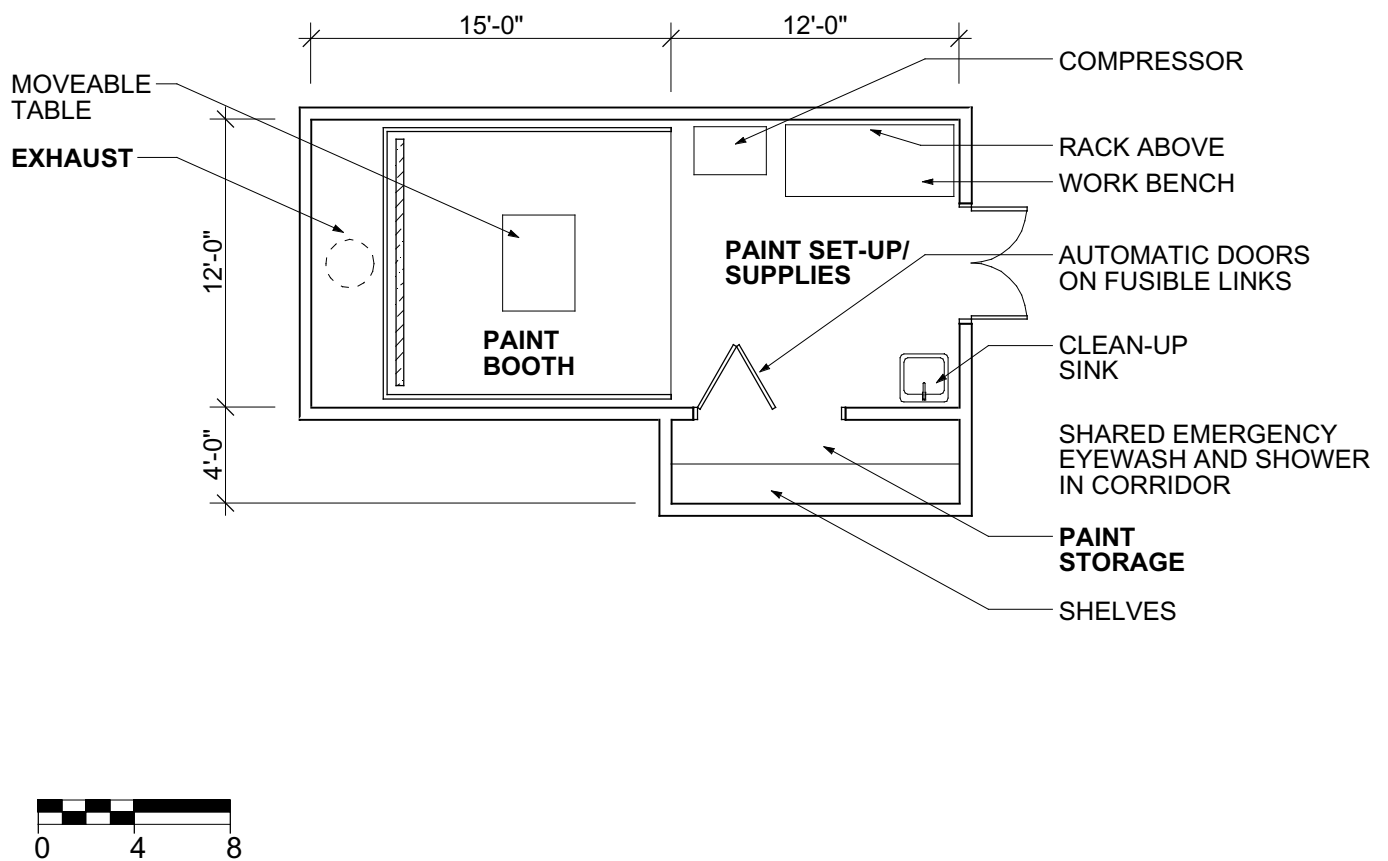
Phone/Data: N/A

Other: Gas Suppression System - Inergen.

Furnishings and Equipment: Heavy duty steel shelving.

Notes: Verify code requirements for blow-out panels in room walls and/or roof.

Prototype Plan:



Notes: Paint storage will require fire separation from other adjacent spaces depending on type and quantity of materials to be stored. If necessary for hazard control, it may be relocated to the loading dock area and open to outside air provided temperatures in the room are sufficiently high to prevent freezing and maintain workability of materials.

4.2.3.4 Paint Set-Up / Supplies

5.3.4 Staff Work Areas

Description

Function: Prep area for exhibit support painting operations.

Capacity: --

Net Area: 150 nsf.

Adjacency/Access

Adjacent to: Paint Booth, Paint Storage (see note on next page).

Access to: Paint Booth Exhaust (through rear of booth), other Exhibit Department spaces, Loading Dock, Freight Elevator, emergency eyewash and shower.

Design Criteria

Architectural

Character: Orderly, efficient, safe, well-organized.

Openings: Double 3' doors to service corridor, open to Paint Booth, fusible link auto doors to Paint Storage.

Ceiling Height/Materials: 8' minimum / Painted exposed structure.

Walls: Epoxy painted gypsum board or concrete block.

Floors: Sealed concrete floor.

Other: Verify fire separation requirements during design phase.

Systems

Structural: Building Standard (see Structural Section 4.3.2). 150 psf floor loading. Forklift loads.

Mechanical: Environment E (see Mechanical Section 4.3.3).

Lighting: Color corrected explosion-proof fluorescent.

Power: 120 v. convenience explosion protected outlets above bench level and as needed for compressor.

Plumbing: Clean up sink with sediment/chemical trap.

Security: Low Security (see Electrical Section 4.3.6).

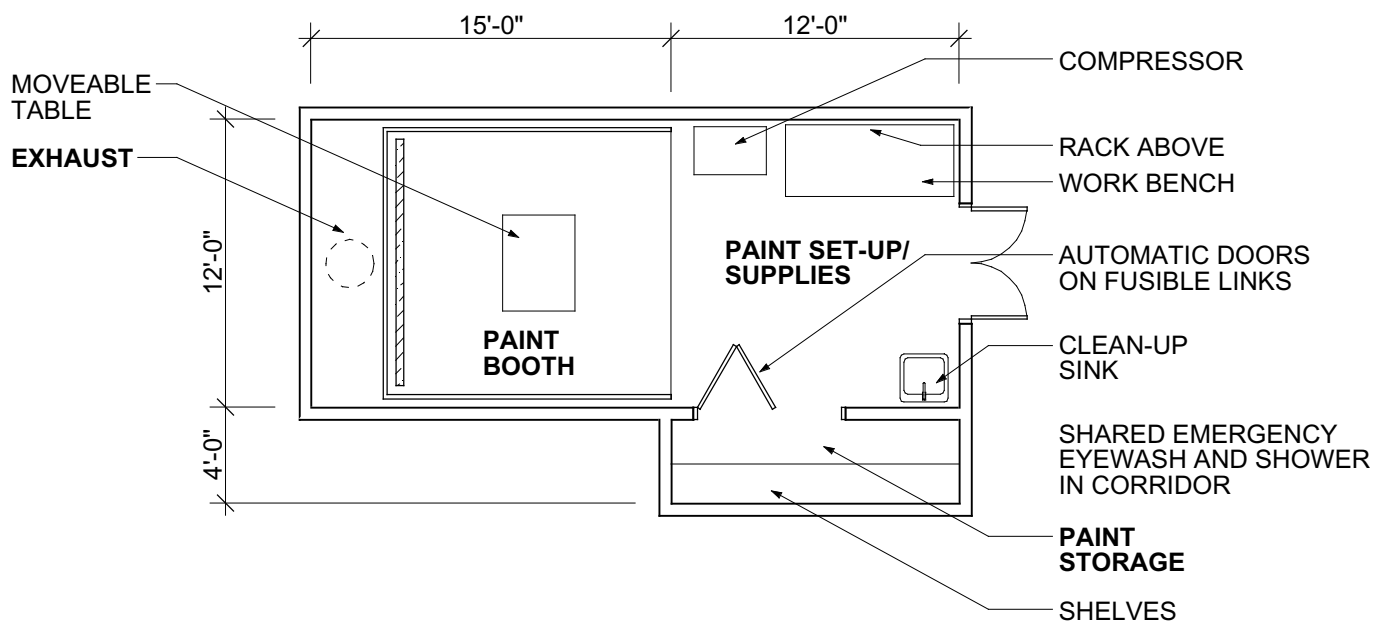
Phone/Data: N/A.

Other: Gas Suppression System - Inergen.

Furnishings and Equipment: Air compressor for paint spray. Work bench with cabinets below and tool rack above.

Notes: Verify code requirements for blow-out panels in room walls and/or roof.

Prototype Plan:



Notes:

4.2.4.1 Exhibit Mount Workroom

5.3.4 Staff Work Areas

Description

Function: Workshop for welding, brazing, and fabricating metal components for exhibits.

Capacity: --

Net Area: 200 nsf.

Adjacency/Access

Adjacent to: Mount Storage.

Access to: Other Exhibit Department Areas, Loading Dock, Freight Elevator, Exhibit Office Suite, eye-wash station and shower, first-aid, Painting.

Design Criteria

Architectural

Character: Modern metal shop.

Openings: Double 3' doors to service corridor.

Ceiling Height/Materials: 12' high minimum / Painted exposed structure. Acoustic baffles.

Walls: Epoxy painted concrete walls.

Floors: Sealed concrete floor.

Other: Verify fire separation requirements during design phase.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment F (see Mechanical Section 4.3.3). Direct exhaust. Verify if welding hood required.

Lighting: Recessed direct fluorescent ambient with occupant sensors with gooseneck task lighting.

Power: 120 v. convenience outlets, pull-down cord reels and other power as needed for final list of welding equipment.

Plumbing: Gas and compressed air at all work surfaces.

Security: Low Security (see Electrical Section 4.3.6).

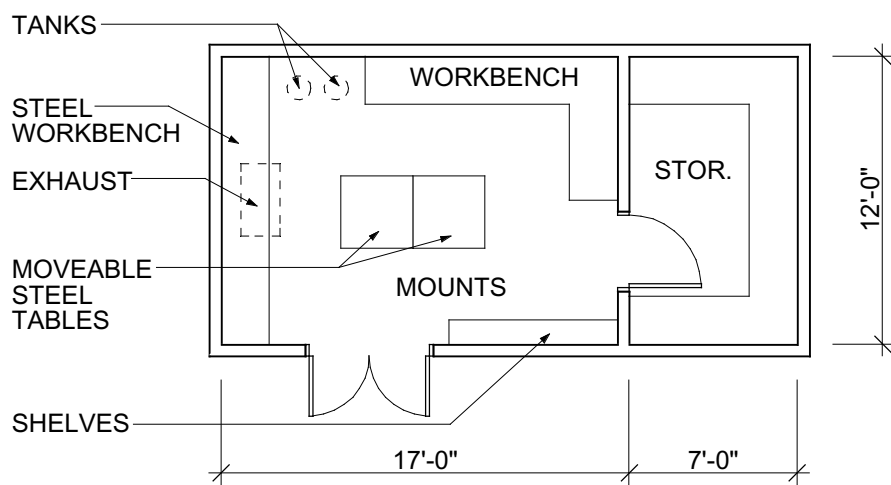
Phone/Data: Telephone and network connections.

Other: Verify need for electrostatic precipitators during design phase.

Furnishings and Equipment: Metal workbenches with cabinets below. Metal shelving. Mobile metal tables (same height as workbenches, or adjustable height). Various metal-working hand tools.

Notes: Verify welding/brazing techniques and tools with Museum during design phase. Must be separated from areas with flammable materials.

Prototype Plan:



Notes:

4.2.4.2 Mount Storage

5.3.4 Staff Work Areas

Description

Function: Storage for materials and tools used in Exhibit Mount Workroom.

Capacity: --

Net Area: 80 nsf.

Adjacency/Access

Adjacent to: Exhibit Mount Workroom.

Access to: Other Exhibit Department Areas, Loading Dock, Freight Elevator, Exhibits Office Suite, eyewash station.

Design Criteria

Architectural

Character: Utility.

Openings: Single 3' door to Exhibit Mount Workroom.

Ceiling Height/Materials: 9' minimum / Painted exposed structure.

Walls: Epoxy painted gypsum board or cmu.

Floors: Sealed concrete floor.

Other: Verify bottle gas storage and fire separation requirements during design phase.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment F (see Mechanical Section 4.3.3).

Lighting: Utility grade direct fluorescent with occupant sensors.

Power: 120 v. convenience outlets.

Plumbing: N/A

Security: Low Security (see Electrical Section 4.3.6).

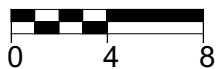
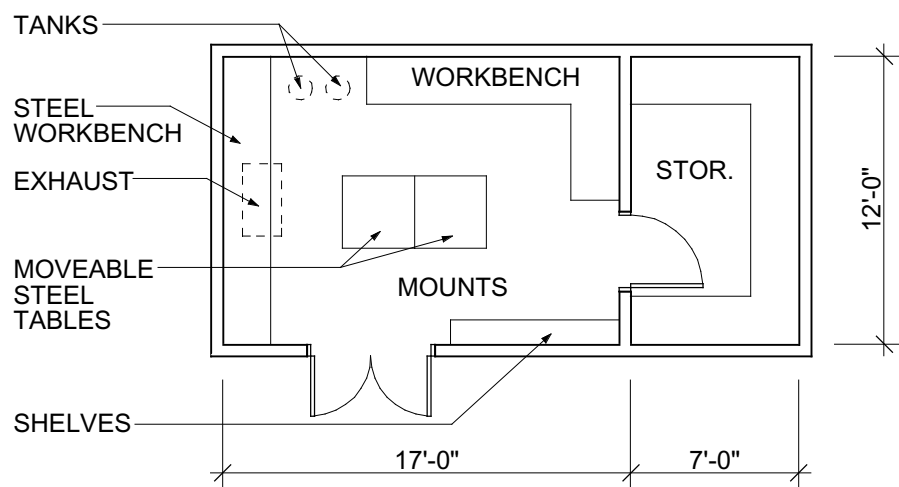
Phone/Data: N/A.

Other:

Furnishings and Equipment: Metal shelving.

Notes:

Prototype Plan:



Notes:

4.2.5.1 Staging / Clean Assembly Workroom

5.3.4 Staff Work Areas

Description

Function: Workroom for assembling exhibition components with collection objects prior to installation in galleries or to shipping for travelling shows.

Capacity: --

Net Area: 580 nsf.

Adjacency/Access

Adjacent to: Staging Supply/Storage, Mobile Digital Studio Storage, Technical Shared/Clean Work Space, Exhibits Office Suite.

Access to: Other Exhibit Department Areas, Loading Dock, Freight Elevator, Observatories, Exhibits Office Suite.

Design Criteria

Architectural

Character: Clean, neat, pleasant, secure.

Openings: 3' double doors (8' minimum height) to service corridor and Digital Studio storage. Single 3' door to supply storage. High windows for controllable natural light.

Ceiling Height/Materials: 12' high / Acoustic ceiling tile.

Walls: Painted gypsum board.

Floors: Seamless resilient flooring.

Other:

Systems

Structural: Building Standard (see Structural Section 4.3.2). 150 psf floor loading. Forklift loads.

Mechanical: Environment C (see Mechanical Section 4.3.3).

Lighting: Indirect fluorescent ambient. Moveable task lighting.

Power: 120 v. convenience outlets above counters, four locations in floor, four pull-down cord reels.

Plumbing: N/A. No overhead pressurized water or waste piping.

Security: High Security. (see Electrical Section 4.3.6).

Phone/Data: Four telephone and network connections.

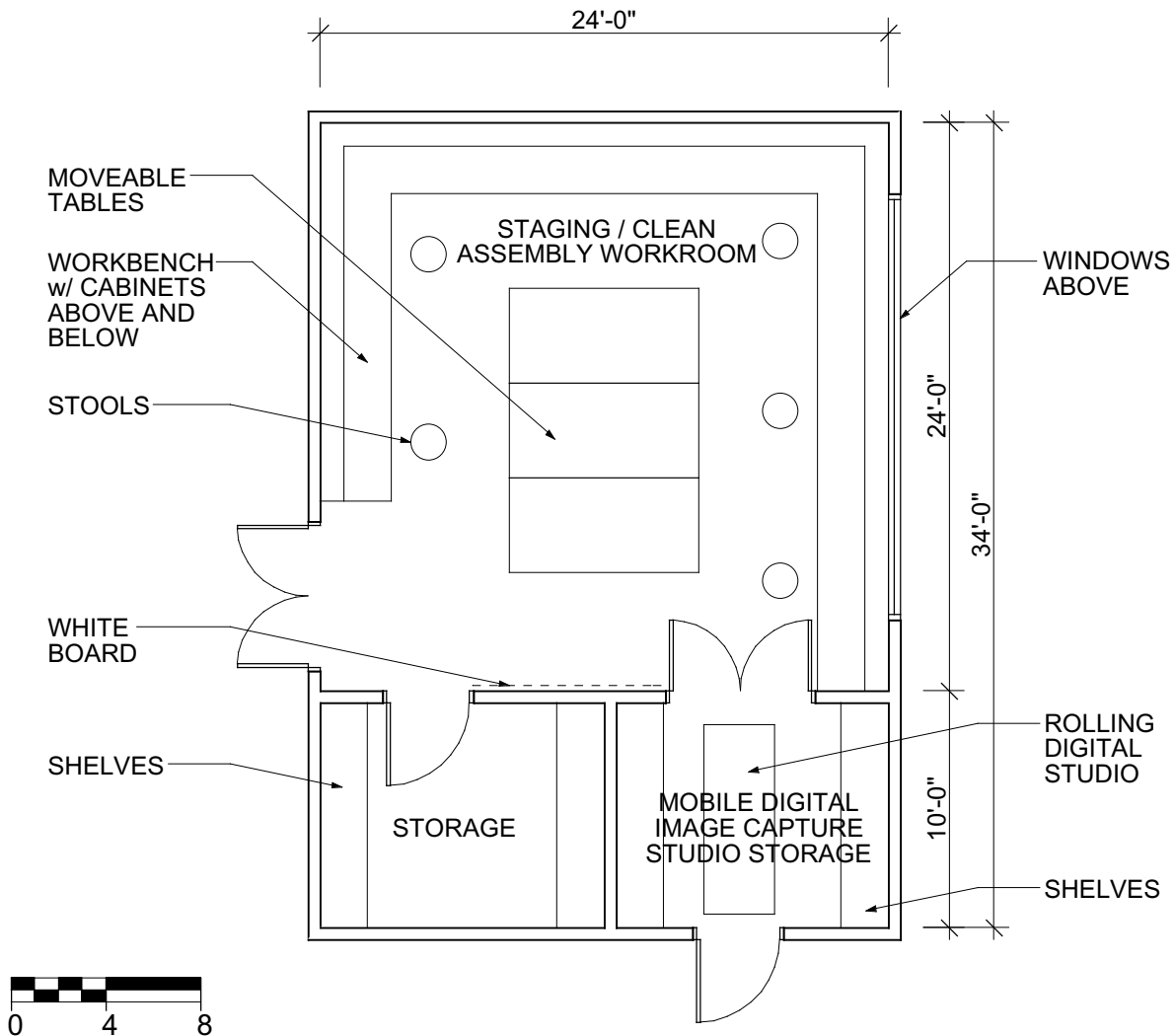
Other: Pre-action Sprinkler System.

Furnishings and Equipment: Perimeter work counters with cabinets above and below. Work stools.

Sewing machines, irons, glue guns, etc.. Rolling work tables.

Notes:

Prototype Plan:



Notes:

4.2.5.2 Staging Supply Storage

5.3.4 Staff Work Areas

Description

Function: Secure storage of materials and projects for Staging/Clean Assembly Workroom.

Capacity: --

Net Area: 100 nsf.

Adjacency/Access

Adjacent to: Staging / Clean Assembly Workroom.

Access to: Other Exhibit Department Areas, Crating/Uncrating, Observatories, Exhibit Office Suite.

Design Criteria

Architectural

Character: Clean, secure, utilitarian.

Openings: Single 3' door with cardswipe to Staging/Clean Assembly Workroom.

Ceiling Height/Materials: 10' high / Painted gypsum board (no ceiling accessibility).

Walls: Epoxy painted gypsum board or concrete block walls.

Floors: Seamless resilient flooring.

Other:

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Indirect fluorescent.

Power: 120 v. convenience wall outlets.

Plumbing: N/A. No overhead pressurized water or waste piping.

Security: High Security (see Electrical Section 4.3.6).

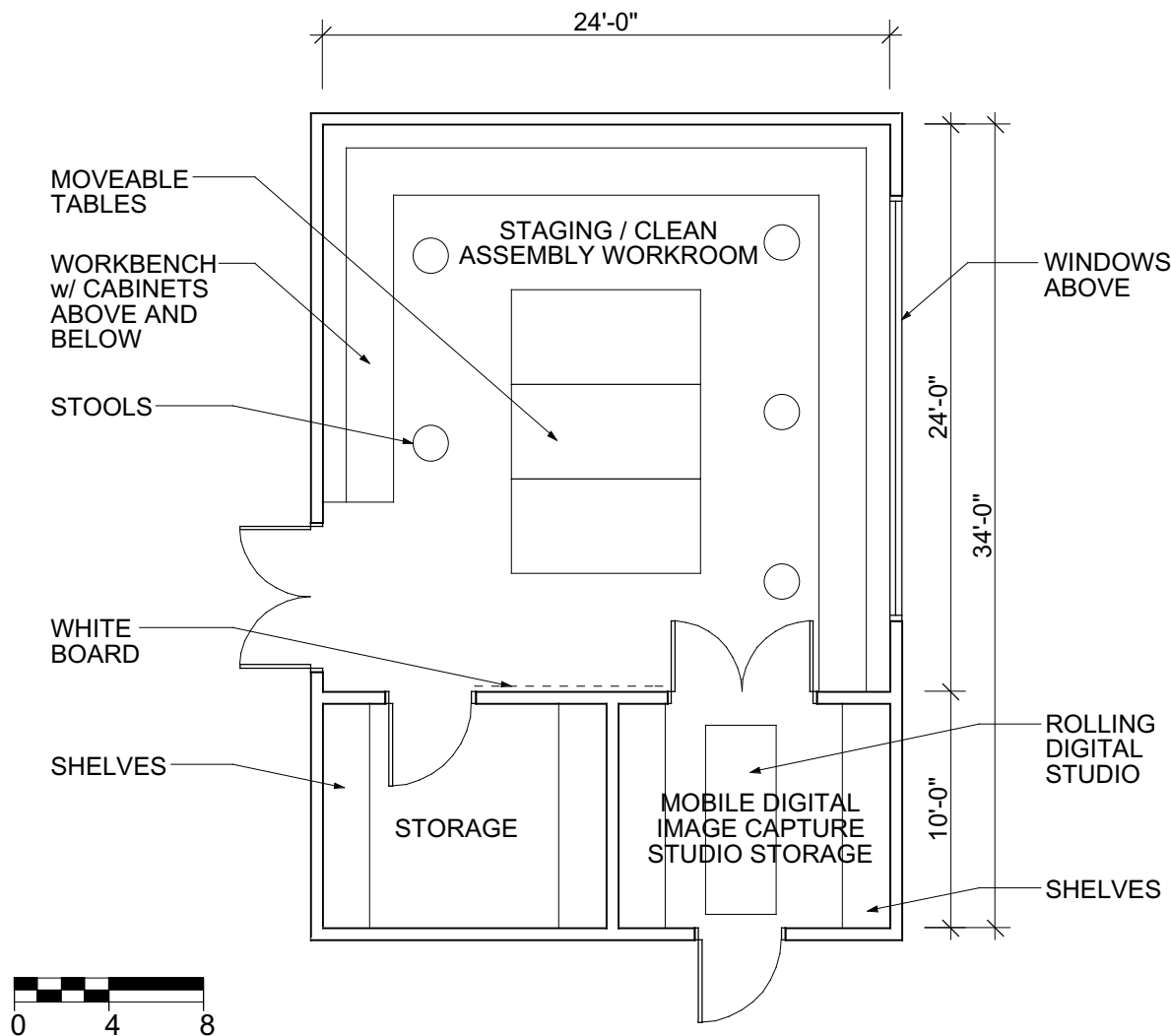
Phone/Data:

Other: Pre-action Sprinkler System.

Furnishings and Equipment: Metal storage shelving. Rolling metal baker's racks. Folding work tables with dolly for storage.

Notes:

Prototype Plan:



Notes:

4.2.5.3 Mobile Digital Image Capture Studio Storage

5.3.4 Staff Work Areas

Description

Function: Storage room for equipment and supplies serving the Mobile Digital Image Capture Studio.

Capacity: --

Net Area: 120 nsf.

Adjacency/Access

Adjacent to: Staging/Clean Assembly Workroom.

Access to: Observatories, Collection Storage Areas, Registrar Suite.

Design Criteria

Architectural

Character: Clean, secure, utilitarian.

Openings: Double 3' doors (with cardswipe) to Staging/Clean Assembly Workroom, single 3' door (with cardswipe to corridor for other departments to have access.

Ceiling Height/Materials: 10' high / Painted gypsum board (no ceiling accessibility).

Walls: Epoxy painted gypsum board or concrete block walls.

Floors: Seamless resilient flooring.

Other:

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Indirect fluorescent.

Power: 120 v. convenience wall outlets.

Plumbing: N/A. No overhead pressurized water or waste piping.

Security: High security (see Electrical Section 4.3.6).

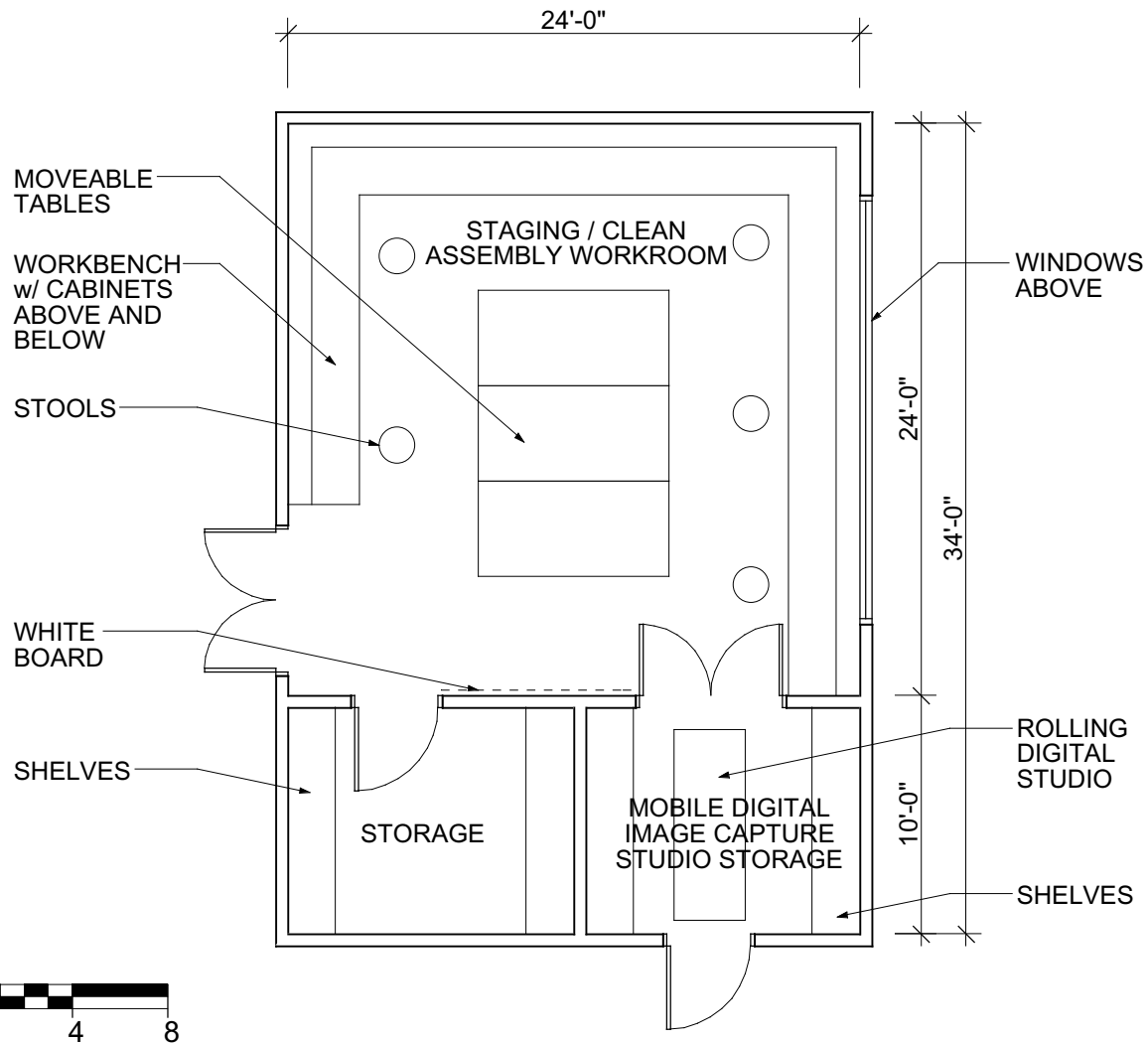
Phone/Data: Two telephone and network connections.

Other: Pre-action Sprinkler System.

Furnishings and Equipment: Metal storage shelving. Rolling digital studio with lockable equipment. Cart, backdrop framework, light booms, and work surface.

Notes: The Mobile Digital Capture Studio is a custom-made, self-contained mobile car fitted out to a complete digital image capture set-up to record collection objects. It is mobile to facilitate efficient access and safety of collection objects.

Prototype Plan:



Notes:

4.2.6 Exhibit Support Storage

5.3.4 Staff Work Areas

Description

Function: Storage room for cases, crates, glass, and graphic panels used in installing exhibitions.

Capacity: --

Net Area: 400 nsf.

Adjacency/Access

Adjacent to: Other Exhibit Department Areas.

Access to: Loading Dock (via forklift), Freight Elevator, Temporary Exhibit Galleries.

Design Criteria

Architectural

Character: Clean, secure, utilitarian.

Openings: Double 4' doors with removable mullion (8' high minimum). Cardswipe to Staging/Clean Assembly Workroom. Natural daylighting desirable.

Ceiling Height/Materials: 10' high / Painted gypsum board (no ceiling accessibility).

Walls: Epoxy painted gypsum board or concrete block walls.

Floors: Seamless resilient flooring.

Other:

Systems

Structural: Building Standard (see Structural Section 4.3.2). 150 psf floor loading. Forklift loads.

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Direct lay-in fluorescent.

Power: 120 v. convenience wall outlets.

Plumbing: N/A. No overhead pressurized water or waste piping.

Security: Low Security (see Electrical Section 4.3.6).

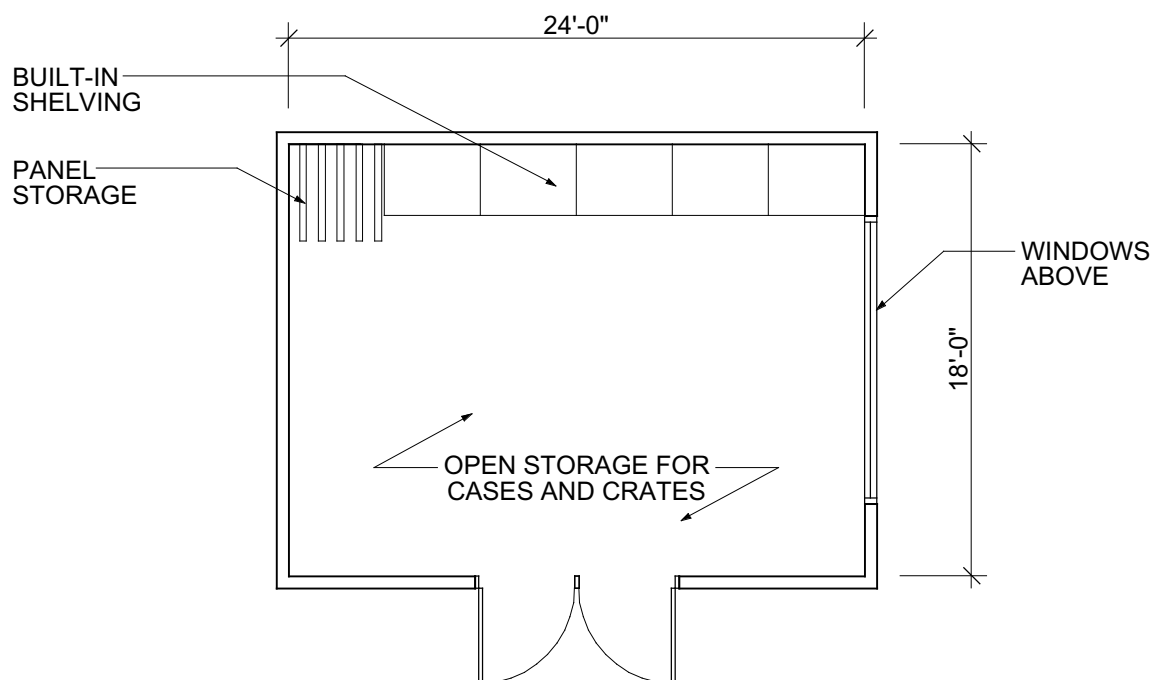
Phone/Data: Two telephone and network connections.

Other: Pre-action Sprinkler System.

Furnishings and Equipment: Built-in deep shelving and slotted bins for panel storage.

Notes: Forklift access desirable.

Prototype Plan:



Notes:

4.2.7 Staff Restrooms

Description

Function: One male and one female toilet rooms for staff.

Capacity: --

Net Area: 230 nsf.

Adjacency/Access

Adjacent to: Exhibit Department Areas.

Access to: Custodial Closet.

Design Criteria

Architectural

Character: Clean, smooth, durable, efficient.

Openings: Single 3' door with privacy baffle to public circulation for each room.

Ceiling Height/Materials: 8' minimum / Epoxy painted gypsum board with dropped soffits over sinks.

Walls: Ceramic tile.

Floors: Ceramic tile.

Other: Stainless steel partitions and accessories. Mirror over sink.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D with direct exhaust (see Mechanical Section 4.3.3).

Lighting: Baffled fluorescent over sinks. Recessed downlights elsewhere.

Power: Code Standard.

Plumbing: Faucets, urinals, and toilets with sensors. Sinks and floor drain.

Security: University standard.

Phone/Data: N/A.

Other:

Furnishings and Equipment:

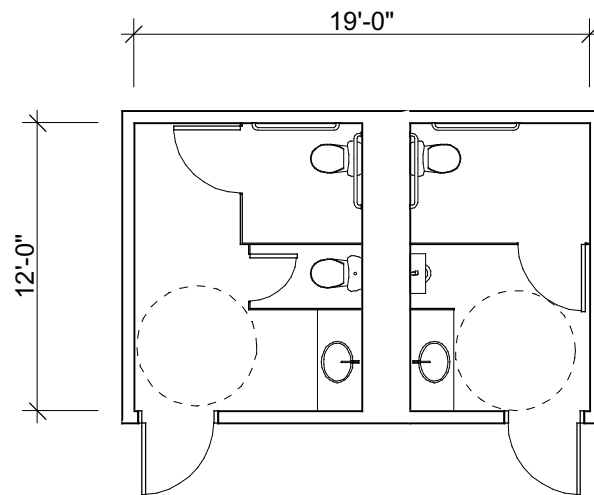
Notes: ADA accessible.

5.3.4 Staff Work Areas

5.3.4 Staff Work Areas

4.2.7 Staff Restrooms

Prototype Plan:



Notes: Restroom fixture counts are based on the following:

Public Restrooms

Female: 32 water closets / 12 lavatories

Male: 18 water closets / 12 lavatories

Staff Restrooms

Female: 6 water closets / 3 lavatories

Male: 6 water closets / 3 lavatories

These are preliminary counts based on the program square footage. Actual fixture counts must be verified during the design based on the actual size/configuration of the Museum.

4.3.1.1 Staff Lounge Seating

5.3.4 Staff Work Areas

Description

Function: Breakroom, lunchroom, lounge and resource center for staff.

Capacity: --

Net Area: 300 nsf.

Adjacency/Access

Adjacent to: Kitchenette.

Access to: 5.3.4 Staff Work Areas, Staff Restrooms.

Design Criteria

Architectural

Character: Inviting, pleasant, comfortable, efficient, warm.

Openings: Open to circulation or double 3' doors. Windows and views wherever possible. Vestibule with double 3' doors to outside.

Ceiling Height/Materials: 9' minimum / Acoustic ceiling tile and gypsum board soffits.

Walls: Painted gypsum board.

Floors: Carpet.

Other: Built-in solid surface counter with wood shelves above and lockable cabinets below. Built-in wood shelves.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Indirect ambient above cabinets, direct task lighting, track lighting at bulletin/cork/white board.

Power: Electrical outlet strip above counter and outlets at 10' oc along walls.

Plumbing: N/A

Security: University standard.

Phone/Data: Telephone and network connections. Wireless internet.

Other:

Furnishings and Equipment: Two 3' x 3' adjustable height tables with 8 chairs. Two chairs for counter.

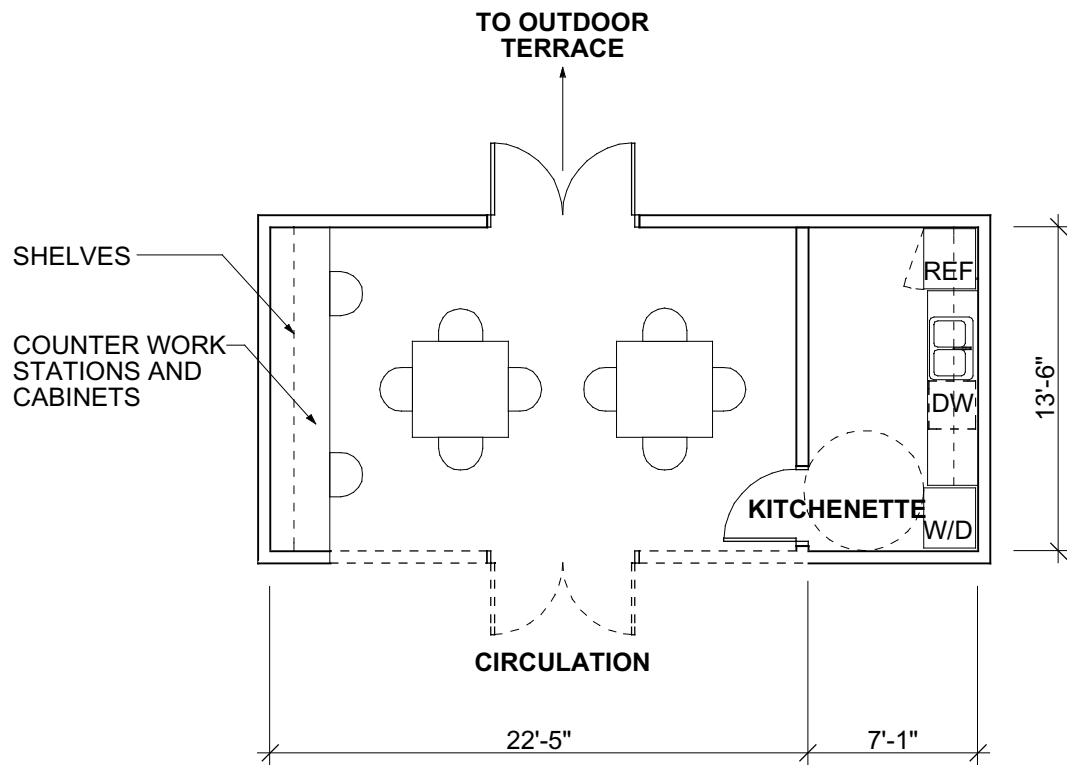
Bulletin/cork boards and large white board. Blinds for windows.

Notes: The adjacent circulation space should be a large, airy, central organizational area for all 5.3.4 Staff Work Areas. Lounge area should have direct access to outdoors for good weather gathering.

5.3.4 Staff Work Areas

4.3.1.1 Staff Lounge Seating

Prototype Plan:



Notes:

4.3.1.2 Staff Lounge Kitchenette

5.3.4 Staff Work Areas

Description

Function: Small kitchen area serving the Staff Lounge Seating Area.

Capacity: --

Net Area: 100 nsf.

Adjacency/Access

Adjacent to: Staff Lounge Seating Area.

Access to: Trashroom, Loading Dock, 5.3.4 Staff Work Areas.

Design Criteria

Architectural

Character: Clean, efficient, minimal.

Openings: Separated from Staff Lounge Seating by 3' access door.

Ceiling Height/Materials: 9' height / Acoustic ceiling tile.

Walls: Epoxy-painted gypsum board.

Floors: Resilient flooring.

Other: Built-in solid surface counter with shelves above and plastic laminate cabinets below.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment E with direct exhaust (see Mechanical Section 4.3.3).

Lighting: Lay-in fluorescent lighting above cabinets, fluorescent lighting below.

Power: 120 v. convenience outlets above counters and as required for appliances.

Plumbing: Double sink, dishwasher, ice maker in refrigerator, stackable washer-dryer.

Security: University standard.

Phone/Data: N/A

Other:

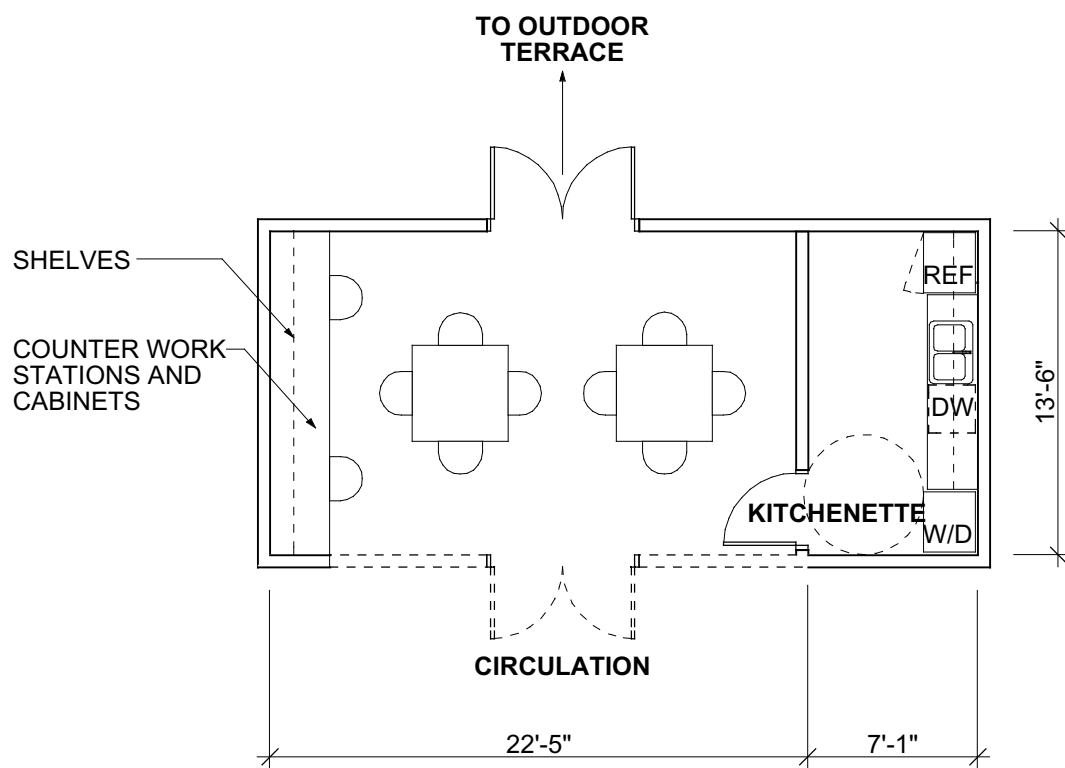
Furnishings and Equipment: Appliances: Full height refrigerator/freezer with ice tray, dishwasher, two microwave ovens. Upper and lower cabinets maximizing storage efficiency.

Notes: Kitchenette must be an enclosed room even if the Staff Lounge Seating is not.

5.3.4 Staff Work Areas

4.3.1.2 Staff Lounge Kitchenette

Prototype Plan:



Notes:

4.3.2 Volunteer Lounge

5.3.4 Staff Work Areas

Description

Function: Breakroom, lunchroom, lounge, library, lockers, check-in station and resource center for volunteers.

Capacity: 12 people.

Net Area: 400 nsf.

Adjacency/Access

Adjacent to: Education Suite.

Access to: Volunteer Work Areas, trashrooms, Staff Lounge Kitchenette.

Design Criteria

Architectural

Character: Inviting, pleasant, comfortable, efficient, warm.

Openings: 3' access door. Windows and views wherever possible.

Ceiling Height/Materials: 9' minimum / Acoustical ceiling tile and gypsum board soffits.

Walls: Painted gypsum board.

Floors: Carpet.

Other: Built-in solid surface counter with wood shelves above and lockable cabinets below. Built-in wooden bookshelves.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Indirect ambient, direct task lighting, track lighting at bulletin/cork/white board.

Power: Electrical outlet strip above counter and outlets at 10' oc along walls.

Plumbing: Sink.

Security: University standard.

Phone/Data: Telephone and network connections. Wireless internet.

Other:

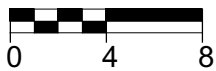
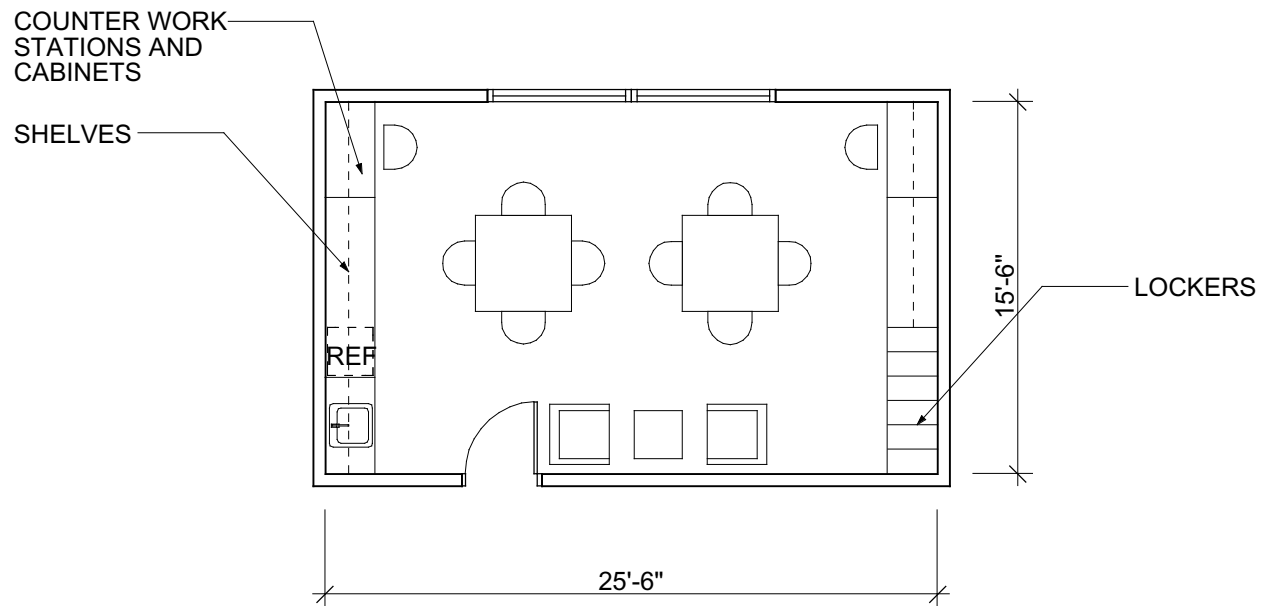
Furnishings and Equipment: Two 3' x 3' adjustable height tables with 8 stools. Bulletin/cork boards and large white board. Two lounge chairs with coffee table. Two chairs for counter. Counter with sink, under-counter refrigerator, file cabinets, bookshelves, coat hooks and lockers.

Notes:

5.3.4 Staff Work Areas

4.3.2 Volunteer Lounge

Prototype Plan:



Notes:

4.3.3.1 Meeting Room for 16

5.3.4 Staff Work Areas

Description

Function: Shared staff conference room seating 16.

Capacity: 16 people.

Net Area: 300 nsf.

Adjacency/Access

Adjacent to: 5.3.4 Staff Work Areas.

Access to: Staff Entry.

Design Criteria

Architectural

Character: Pleasant, comfortable, efficient, warm.

Openings: 3' access door. Windows and views wherever possible.

Ceiling Height/Materials: 9' minimum / Acoustical ceiling tile and gypsum board soffits.

Walls: Painted gypsum board and wood trim.

Floors: Carpet.

Other: Built-in solid surface counter, cabinets below. Full height tackable wall surface along one wall.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Indirect ambient, direct task lighting, track lighting at bulletin/cork/white board.

Power: Electrical outlet strip above counter and outlets at 10' oc along walls. Power for roll-down projection screen.

Plumbing: N/A

Security: University standard.

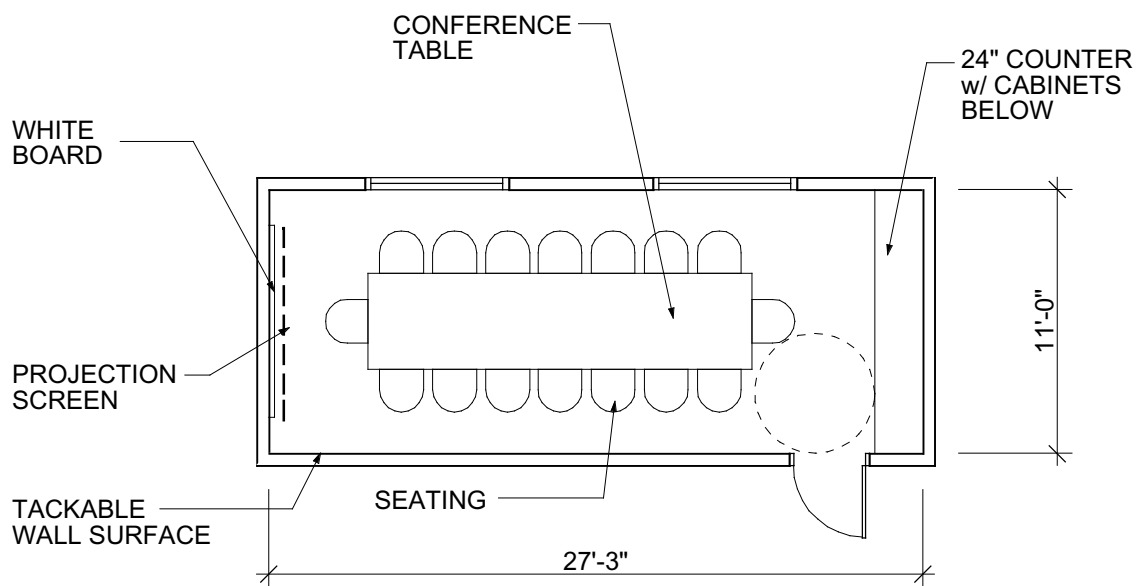
Phone/Data: Telephone and network connections. Wireless internet.

Other:

Furnishings and Equipment: One 4' x 16' conference table with 16 chairs. LCD projector, DVD/CD player, connection for computer, speakers, VCR (project via LCD projector). Bulletin/cork boards and large white board. Roll-down projection screen. Room darkening shades for windows.

Notes:

Prototype Plan:



Notes:

4.3.3.2 Meeting Room for 8

5.3.4 Staff Work Areas

Description

Function: Shared staff conference room seating 8.

Capacity: 8 people.

Net Area: 150 nsf.

Adjacency/Access

Adjacent to: 5.3.4 Staff Work Areas.

Access to: Staff Entry.

Design Criteria

Architectural

Character: Pleasant, comfortable, efficient, warm.

Openings: 3' access door. Windows and views wherever possible.

Ceiling Height/Materials: 9' minimum / Acoustical ceiling tile and gypsum board soffits.

Walls: Painted gypsum board and wood trim.

Floors: Carpet.

Other:

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Indirect ambient, direct task lighting, track lighting at bulletin/cork/white board.

Power: Electrical outlet strip above counter and outlets at 10' oc along walls. Power for roll-down projection screen.

Plumbing: N/A

Security: University standard.

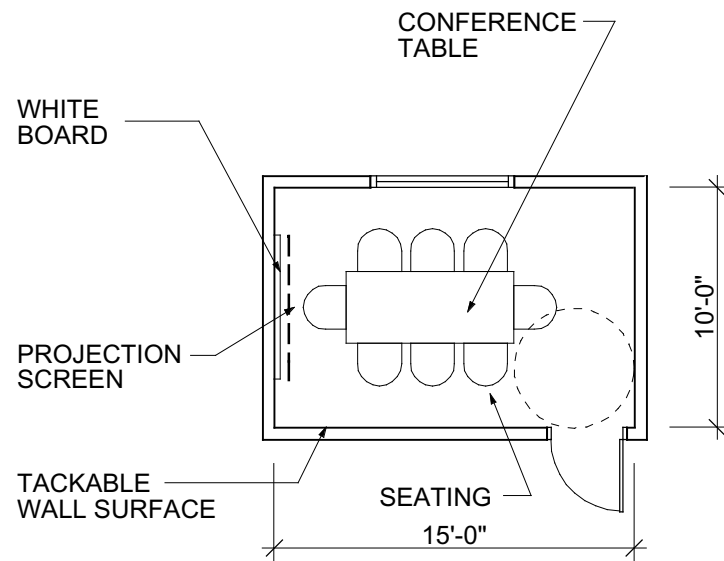
Phone/Data: Telephone and network connections. Wireless internet.

Other:

Furnishings and Equipment: One 3' x 7' conference table with 8 chairs. LCD projector, DVD/CD player, connection for computer, speakers, VCR (project via LCD projector). Bulletin/cork boards and large white board. Roll-down projection screen. Room darkening shades for windows.

Notes:

Prototype Plan:



Notes:

4.3.4 Copier / Workroom / Mailroom

5.3.4 Staff Work Areas

Description

Function: Shared staff workroom, copy center and mailroom.

Capacity: 2 people.

Net Area: 250 nsf.

Adjacency/Access

Adjacent to: Supply storage, all 5.3.4 Staff Work Areas.

Access to: Loading Dock, Freight Elevator.

Design Criteria

Architectural

Character: Simple, clean, efficient, secure.

Openings: 3' access door.

Ceiling Height/Materials: 9' height / Acoustical ceiling tile.

Walls: Painted gypsum board.

Floors: Carpet.

Other: Built-in solid surface counter with shelves above and lockable cabinets below. Mailboxes.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Recessed fluorescent.

Power: Power strip above counter. Outlet on other walls at floor. Coordinate power for copiers and other office equipment during the design phase.

Plumbing: N/A

Security: University standard.

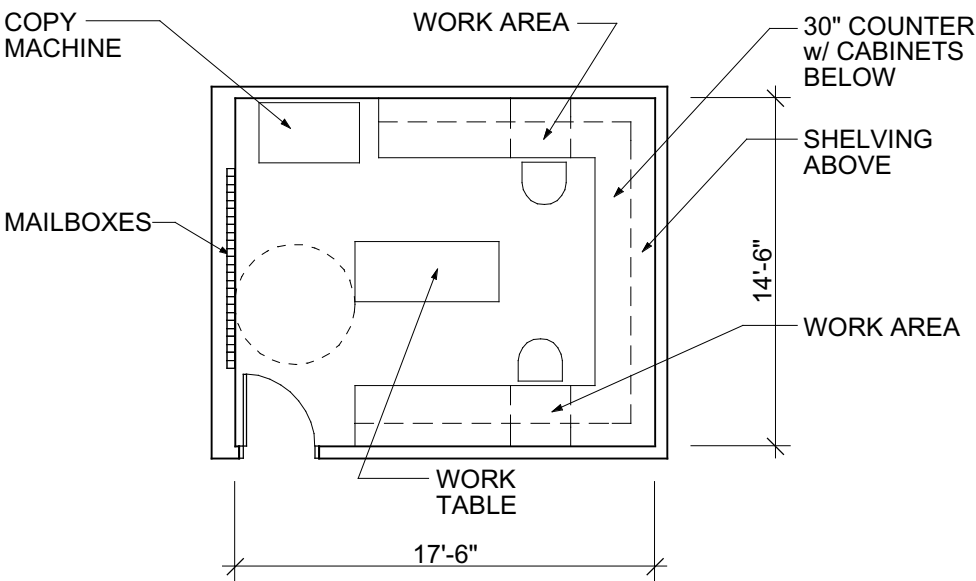
Phone/Data: Telephone and network connections

Other:

Furnishings and Equipment: Copier and printer. Two chairs. Central worktable at stand-up height for sorting materials mailboxes.

Notes: Ceiling of this space can be used as an access point to above ceiling equipment.

Prototype Plan:



Notes:

4.3.5 Closets

5.3.4 Staff Work Areas

Description

Function: Storage of coats for Staff Work Area.

Capacity: 40 coats (each closet).

Net Area: 5 @ 10 nsf each = 50 nsf.

Adjacency/Access

Adjacent to: Staff Work Area Entry.

Access to: Administrative Work Areas, Exhibit Department, and shared areas of 5.3.4 Staff Work Areas.

Design Criteria

Architectural

Character: Simple, clean, efficient, secure.

Openings: Double 30" doors.

Ceiling Height/Materials: 8' minimum height / Accessible acoustic ceiling tile.

Walls: Durable wood and painted surfaces.

Floors: Carpet.

Other: Built-in shelf.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: N/A

Lighting: N/A.

Power: Code standard.

Plumbing: N/A

Security: University standard.

Phone Data: N/A.

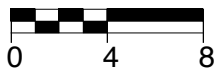
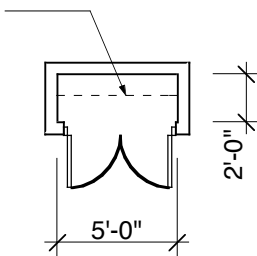
Other:

Furnishings and Equipment: Built-in hanger rod.

Notes:

Prototype Plan:

COAT RACK
AND SHELF



Notes:

4.3.6 Staff Restrooms

5.3.4 Staff Work Areas

Description

Function: One male and one female toilet rooms for staff.

Capacity: --

Net Area: 230 nsf.

Adjacency/Access

Adjacent to: 5.3.4 Staff Work Areas.

Access to: Custodial Closet.

Design Criteria

Architectural

Character: Clean, smooth, durable, efficient.

Openings: Single 3' door with privacy baffle to public circulation for each room.

Ceiling Height/Materials: 8' minimum / Epoxy painted gypsum board with dropped soffits over sinks.

Walls: Ceramic tile.

Floors: Ceramic tile.

Other: Stainless steel partitions and accessories. Mirror over sink.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D with direct exhaust (see Mechanical Section 4.3.3).

Lighting: Baffled fluorescent over sinks. Recessed downlights elsewhere.

Power: Code standard.

Plumbing: Faucets, urinals, and toilets with sensors. Sink and floor drain.

Security: University standard.

Phone/Data: N/A.

Other:

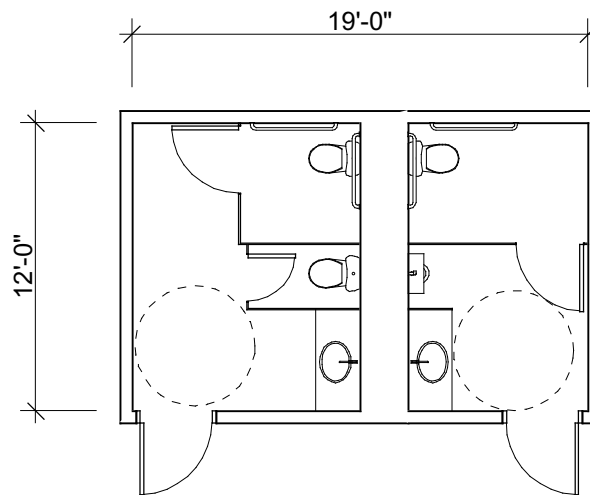
Furnishings and Equipment: Sink, faucet, floor drain, toilet, shower stall, lockers, stools. Stainless steel accessories including soap, towel and toilet paper dispensers, sanitary napkin disposal bin, trash can, towel bin, mirror, coat hooks.

Notes: ADA accessible.

5.3.4 Staff Work Areas

4.3.6 Staff Restrooms

Prototype Plan:



Notes: Restroom fixture counts are based on the following:

Public Restrooms

Female: 32 water closets / 12 lavatories

Male: 18 water closets / 12 lavatories

Staff Restrooms

Female: 6 water closets / 3 lavatories

Male: 6 water closets / 3 lavatories

These are preliminary counts based on the program square footage. Actual fixture counts must be verified during the design based on the actual size/configuration of the Museum.

4.3.7 Staff Showers

5.3.4 Staff Work Areas

Description

Function: Showers and changing areas for use by either male and female staff.

Capacity: 1 person each (2 total).

Net Area: 2 @ 70 nsf each = 140 nsf.

Adjacency/Access

Adjacent to: 5.3.4 Staff Work Areas, Staff Restrooms.

Access to: Custodial Closet.

Design Criteria

Architectural

Character: Clean, smooth, durable, efficient.

Openings: Single 3' door to each room.

Ceiling Height/Materials: 8' minimum / Epoxy painted gypsum board with dropped soffits over sinks.

Walls: Ceramic tile.

Floors: Ceramic tile.

Other: Stainless steel partitions and accessories. Mirror over sink.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D with direct exhaust (see Mechanical Section 4.3.3).

Lighting: Baffled fluorescent over sinks. Recessed downlights elsewhere.

Power: Code standard.

Plumbing: Faucets with sensors. Sink and floor drain. HC accessible shower.

Security: University standard.

Phone/Data: N/A.

Other:

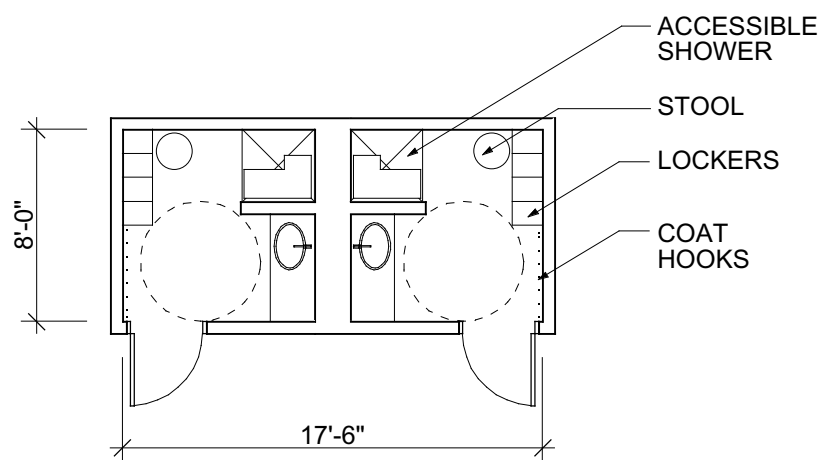
Furnishings and Equipment: Sink, faucet, floor drain, shower stall, lockers, stools. Stainless steel accessories including soap, towel and toilet paper dispensers, sanitary napkin disposal bin, trash can, towel bin, mirror, coat hooks.

Notes: ADA accessible.

5.3.4 Staff Work Areas

4.3.7 Staff Showers

Prototype Plan:



Notes:

4.3.8 Supply Storage

Description

Function: Storage room for printed materials.

Capacity: --

Net Area: 150 nsf.

Adjacency/Access

Adjacent to: Copier/Workroom/Mailroom.

Access to: 5.3.4 Staff Work Areas.

Design Criteria

Architectural

Character: Simple, clean, efficient, secure.

Openings: Single 3' access door.

Ceiling Height/Materials: 8' minimum height / Acoustic ceiling tile.

Floors: Seamless resilient flooring.

Walls: Durable wood and painted gypsum board surfaces.

Other:

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Recessed fluorescent downlights.

Power: Code standard.

Plumbing: N/A

Security: University standard.

Phone/Data: N/A.

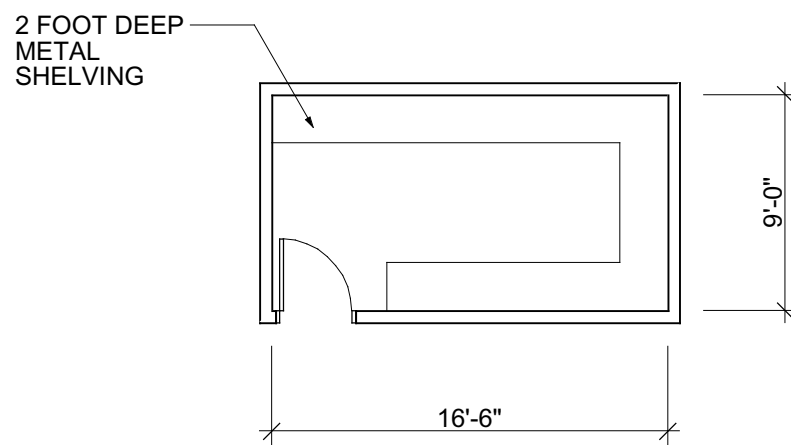
Other:

Furnishings and Equipment: 2' deep metal shelving units.

Notes:

5.3.4 Staff Work Areas

Prototype Plan:



Notes:

4.3.9 Graphic Production/Sign Shop/Education Kit Assembly 5.3.4 Staff Work Areas

Description

Function: A shared workspace for graphic production, sign making, and assembly, repair, and storage of education department outreach kits.

Capacity: --

Net Area: 500 nsf.

Adjacency/Access

Adjacent to: Exhibits Office Suite, Staging/Clean Assembly, Technical Studio.

Access to: Loading Dock (or Freight Elevator), Graphic Design Office Suite, Education Offices, Public Program Spaces, emergency eyewash station.

Design Criteria

Architectural

Character: Well-lit, comfortable, efficient, lab-like, clean workshop.

Openings: 3' door to shared corridor. Window with natural light is important.

Ceiling Height/Materials: 10' high / Acoustic ceiling tile.

Walls: Painted gypsum board.

Floors: Seamless resilient flooring.

Other:

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3). Review requirements during design phase.

Lighting: Recessed fluorescent ambient. Under counter task lighting.

Power: 120 v. outlets above work counter.

Plumbing: Sink.

Security: University standard.

Phone/Data: Four telephone and network connections.

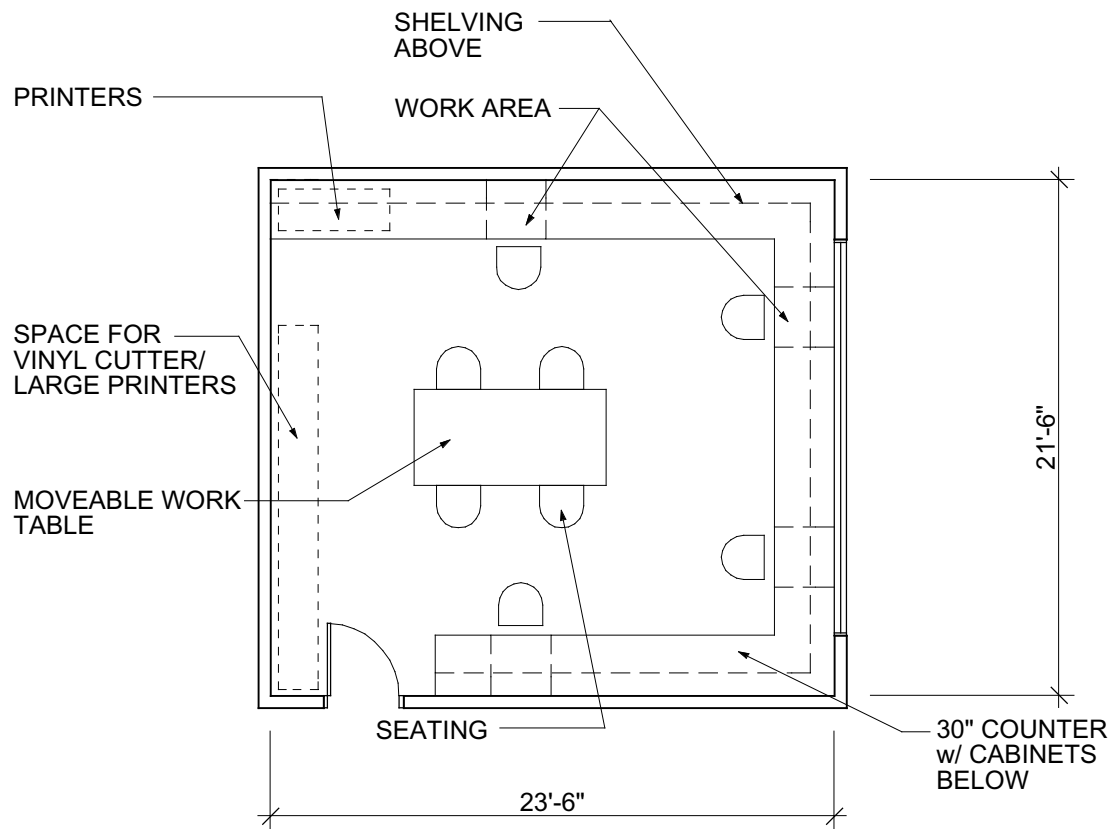
Other: Pre-action Sprinkler System.

Furnishings and Equipment: Perimeter work counter with cabinets above and below. Tube and board storage. Whiteboard and corkboard. Computers, vinyl cutter/laminator, multi-material cutter, dry mount press, mat cutter, paper cutter, etc.. Mobile work tables. Storage rack for education kits.

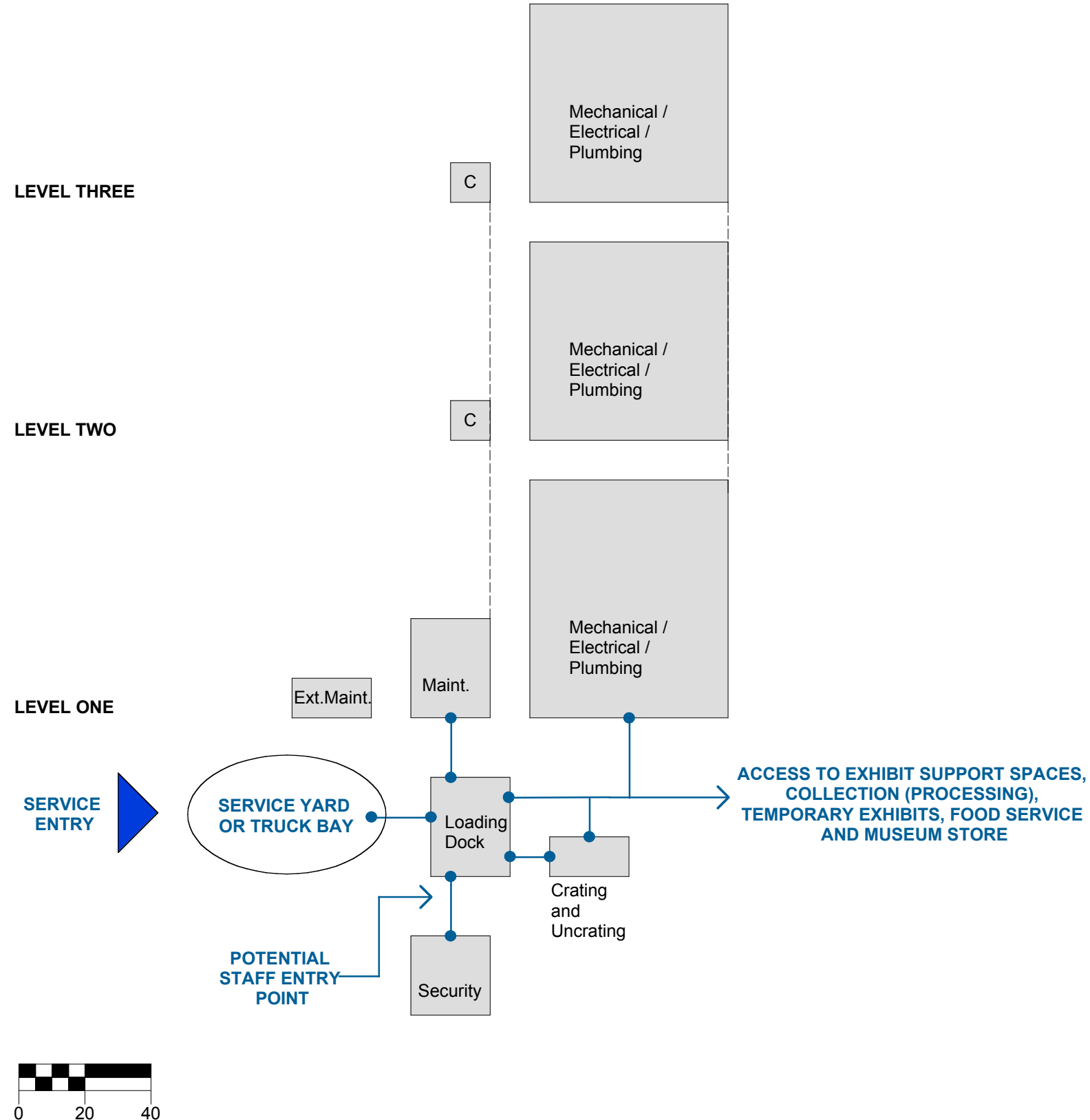
Notes:

5.3.4 Staff Work Areas 4.3.9 Graphic Production/Sign Shop/Education Kit Assembly

Prototype Plan:



Notes:



5.1.1 Receiving Area

5.3.5 Building Services

Description

- Function: Receiving Area for all exhibit and food items.
- Capacity: --
- Net Area: 400 sf.

Adjacency/Access

- Adjacent to: Security, Trash Room, Field Equipment Storage, Crating and Uncrating, and Forklift Charging Station.
- Access to: Forklift access to Exhibit Storage, Temporary Exhibit Galleries, Observatories, Crating and Uncrating, Freight Elevator, Isolation Room.

Design Criteria

Architectural

- Character: Clean, efficient, and durable.
- Openings: Two 12’ wide (minimum) roll up doors (minimum 12’ high), two 3’ doors.
- Ceiling Height/Materials: 15’ minimum / Exposed structure.
- Walls: Epoxy painted concrete block.
- Floors: Exposed concrete.
- Other: Raised concrete loading dock platform, dock leveler, ramp and stair at covered Loading Dock, corner guards as required (see note below).

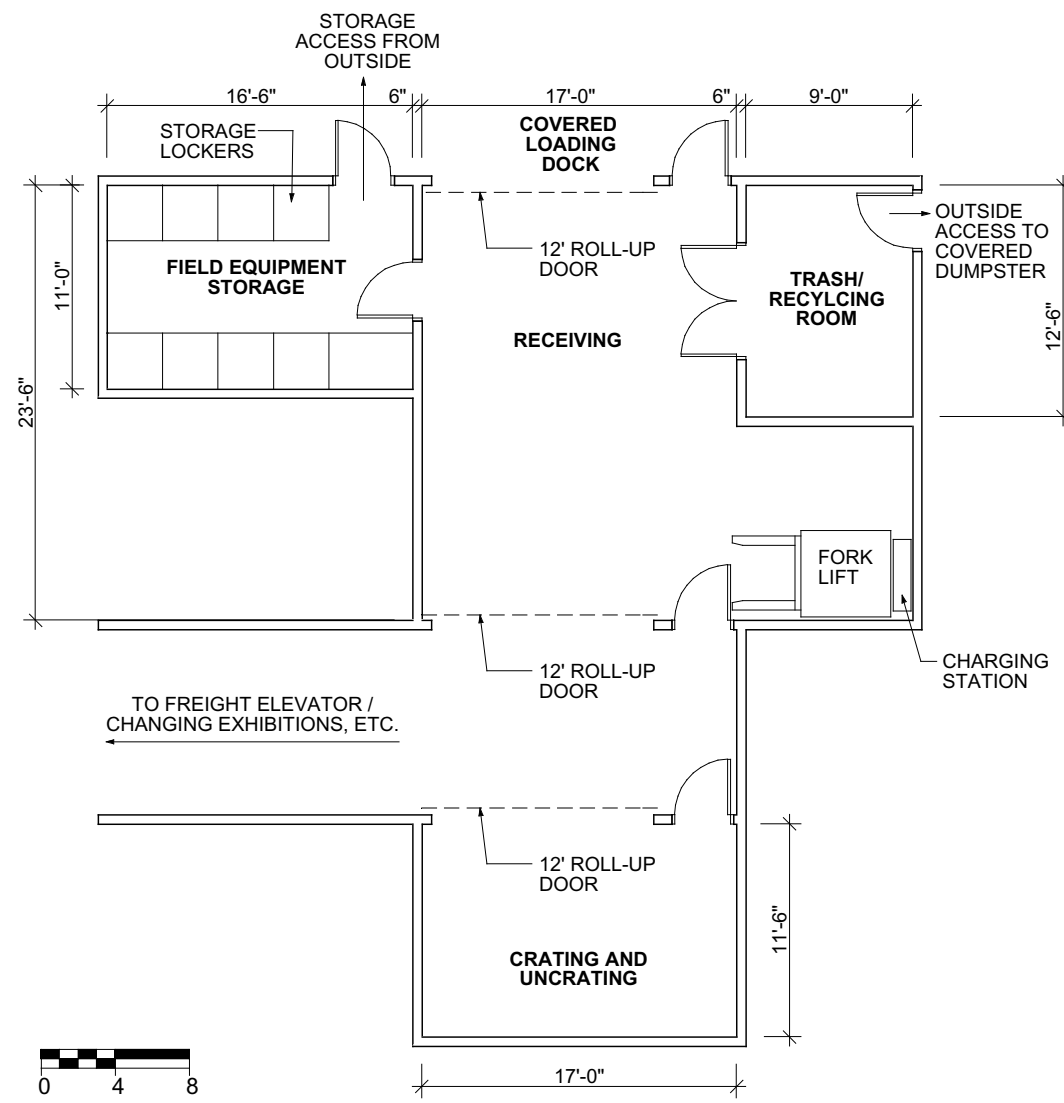
Systems

- Structural: Building Standard (see Structural Section 4.3.2). 150 psf floor loading. Forklift loads.
- Mechanical: Environment C (see Mechanical Section 4.3.3).
- Lighting: Fluorescent.
- Power: Code Standard. Power for roll-up doors.
- Plumbing: N/A
- Security: High Security (see Electrical Section 4.3.3).
- Phone/Data: Intercom equipment as required.
- Other: Pre-action Sprinkler System.

Furnishings and Equipment:

Notes: Covered Loading Dock area itself not included in Museum building area (exterior built element). Separation of receiving, food, museum store and exhibition objects/artifacts must be carefully reviewed during the design phase. Investigate and provide owner with options to roll-up doors for control of pests migration and air seal.

Prototype Plan:



Notes:

5.1.2 Trash / Recycling Room

5.3.5 Building Services

Description

Function: Storage for trash.

Capacity: --

Net Area: 100 sf.

Adjacency/Access

Adjacent to: Opens to Receiving Area or Loading Dock.

Access to: Freight Elevator.

Design Criteria

Architectural

Character: Clean, efficient, and durable.

Openings: One pair of double 3' doors to interior, 3' door to covered dumpster area.

Ceiling Height/Materials: 10' minimum / Exposed structure.

Walls: Epoxy painted concrete block.

Floors: Exposed concrete.

Other:

Systems

Structural: Building Standard (see Structural Section 4.3.2). 150 psf floor loading. Forklift loads.

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Surface mounted fluorescent.

Power: Code standard.

Plumbing: N/A

Security: Low Security (see Electrical Section 4.3.6).

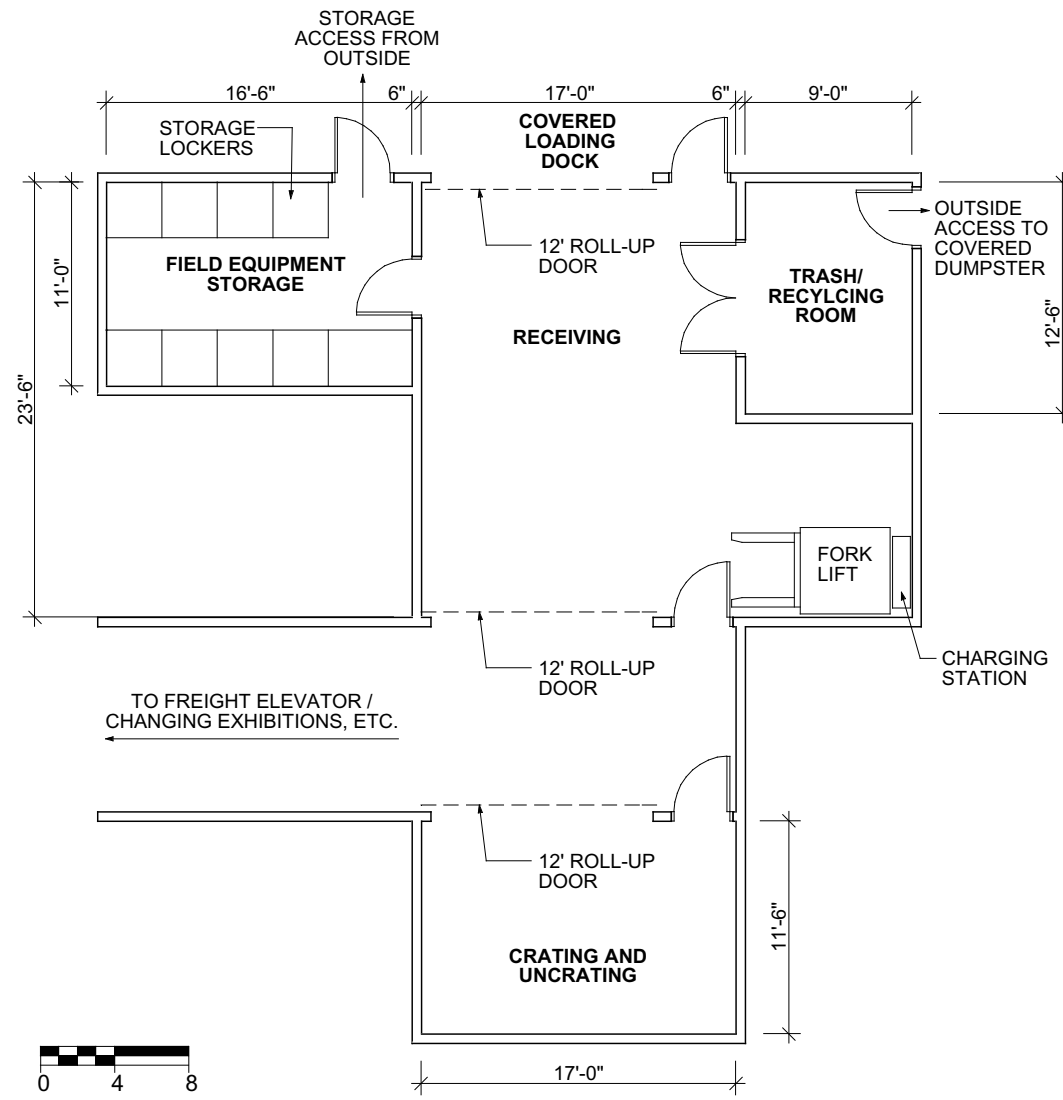
Phone/Data: N/A.

Other:

Furnishings and Equipment:

Notes: Trash removal/recycling should be located away from the loading dock.

Prototype Plan:



Notes:

5.1.3 Crating and Uncrating

5.3.5 Building Services

Description

Function: Area for opening and storing crates.

Capacity: --

Net Area: 200 sf.

Adjacency/Access

Adjacent to: Adjacent to but not open to Receiving Area.

Access to: Freight Elevator.

Design Criteria

Architectural

Character: Clean, efficient, and durable.

Openings: 12' wide (minimum) roll-up door (minimum 12' high), 3' access door.

Ceiling Height/Materials: 15' minimum / Painted gypsum board.

Walls: Epoxy painted concrete block.

Floors: Exposed sealed concrete.

Other:

Systems

Structural: Building Standard (see Structural Section 4.3.2). 150 psf floor loading. Forklift loads.

Mechanical: Environment C (see Mechanical Section 4.3.3).

Lighting: Surface mounted fluorescent.

Power: Code standard.

Plumbing: N/A

Security: High Security (see Electrical Section 4.3.6).

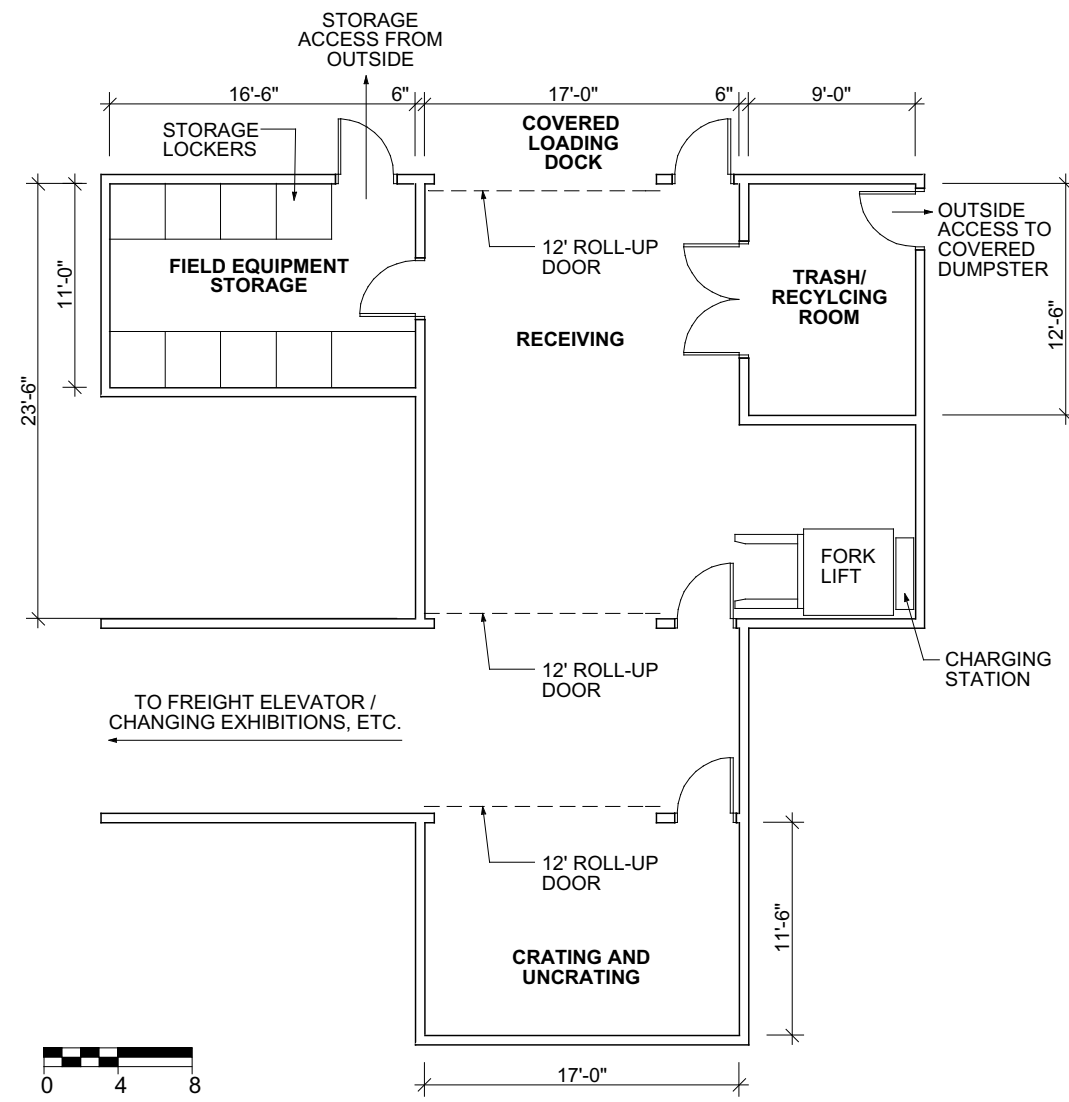
Phone/Data: N/A.

Other: Pre-action Sprinkler System.

Furnishings and Equipment:

Notes: Entrance should not be directly into Receiving Area. Crating and uncrating will need much higher environmental controls.

Prototype Plan:



Notes:

5.1.4 Fork and Scissor Lift Charging Station

5.3.5 Building Services

Description

Function: Charging station and space to park forklift and scissor lift.

Capacity: --

Net Area: 100 sf.

Adjacency/Access

Adjacent to: Open to Receiving Area.

Access to: Freight Elevator.

Design Criteria

Architectural

Character: Clean, efficient, and durable.

Openings: N/A

Ceiling Height/Materials: Coordinate height with equipment / Exposed structure.

Walls: Epoxy painted concrete block.

Floors: Exposed concrete.

Other:

Systems

Structural: Building Standard (see Structural Section 4.3.2). 150 psf floor loading. Forklift loads.

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Surface mounted fluorescent.

Power: Verify requirements with forklift manufacturer.

Plumbing: N/A

Security: Low Security (see Electrical Section 4.3.6).

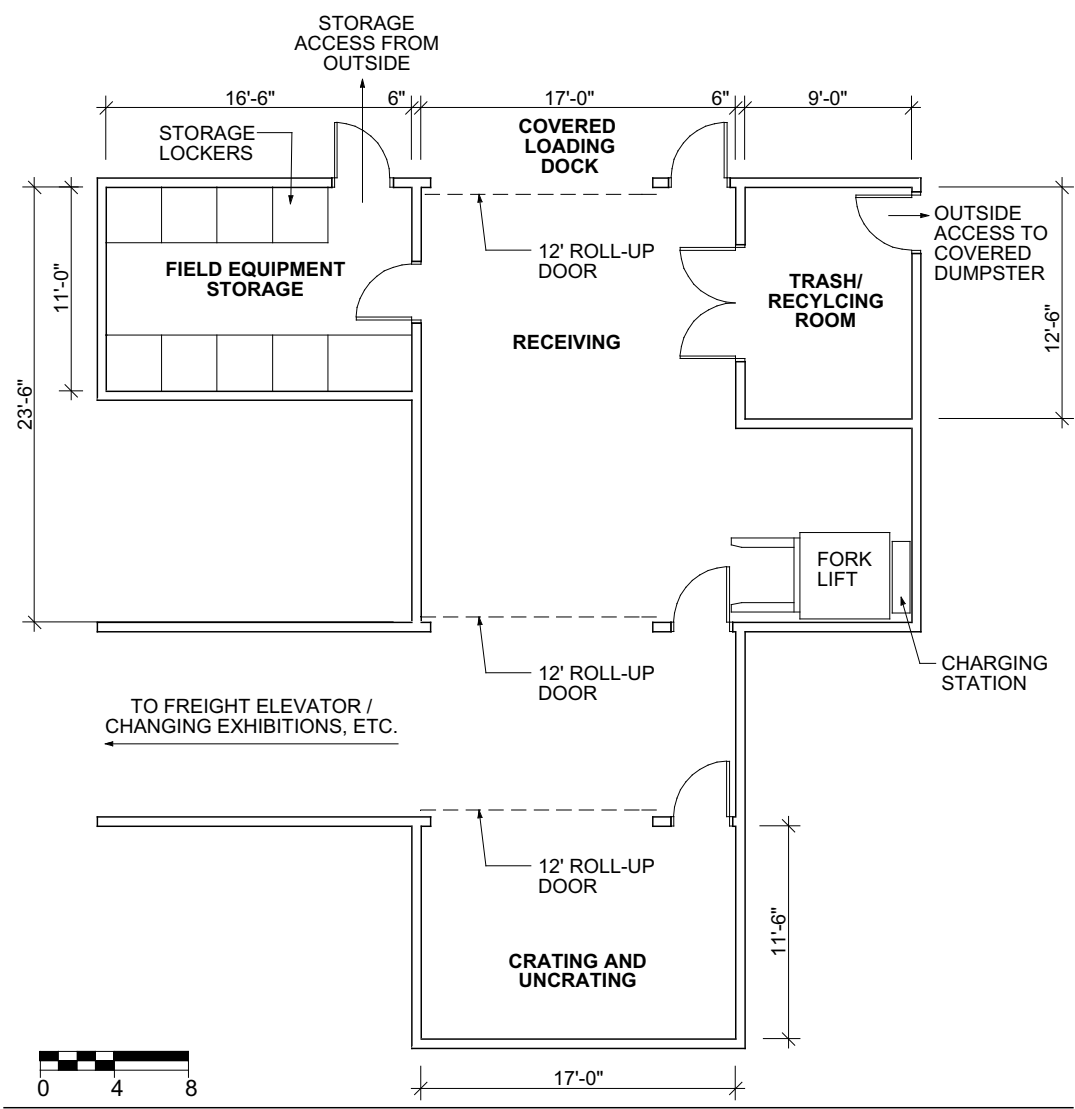
Phone/Data: N/A.

Other:

Furnishings and Equipment: Forklift charging station.

Notes:

Prototype Plan:



Notes:

5.1.5 Field Equipment Storage

5.3.5 Building Services

Description

Function: Dedicated storage for equipment used in field projects for all disciplines.

Capacity: --

Net Area: 180 nsf.

Adjacency/Access

Adjacent to: Receiving Area.

Access to: Outdoor.

Design Criteria

Architectural

Character: Clean, efficient, and durable.

Openings: 3' door to Receiving Area. Optimal 3' door to exterior.

Ceiling Height/Materials: 10' minimum / Exposed structure.

Walls: Epoxy painted concrete block.

Floors: Exposed concrete.

Other:

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Surface mounted fluorescent.

Power: Code standard.

Plumbing: N/A

Security: Low Security (see Electrical Section 4.3.6).

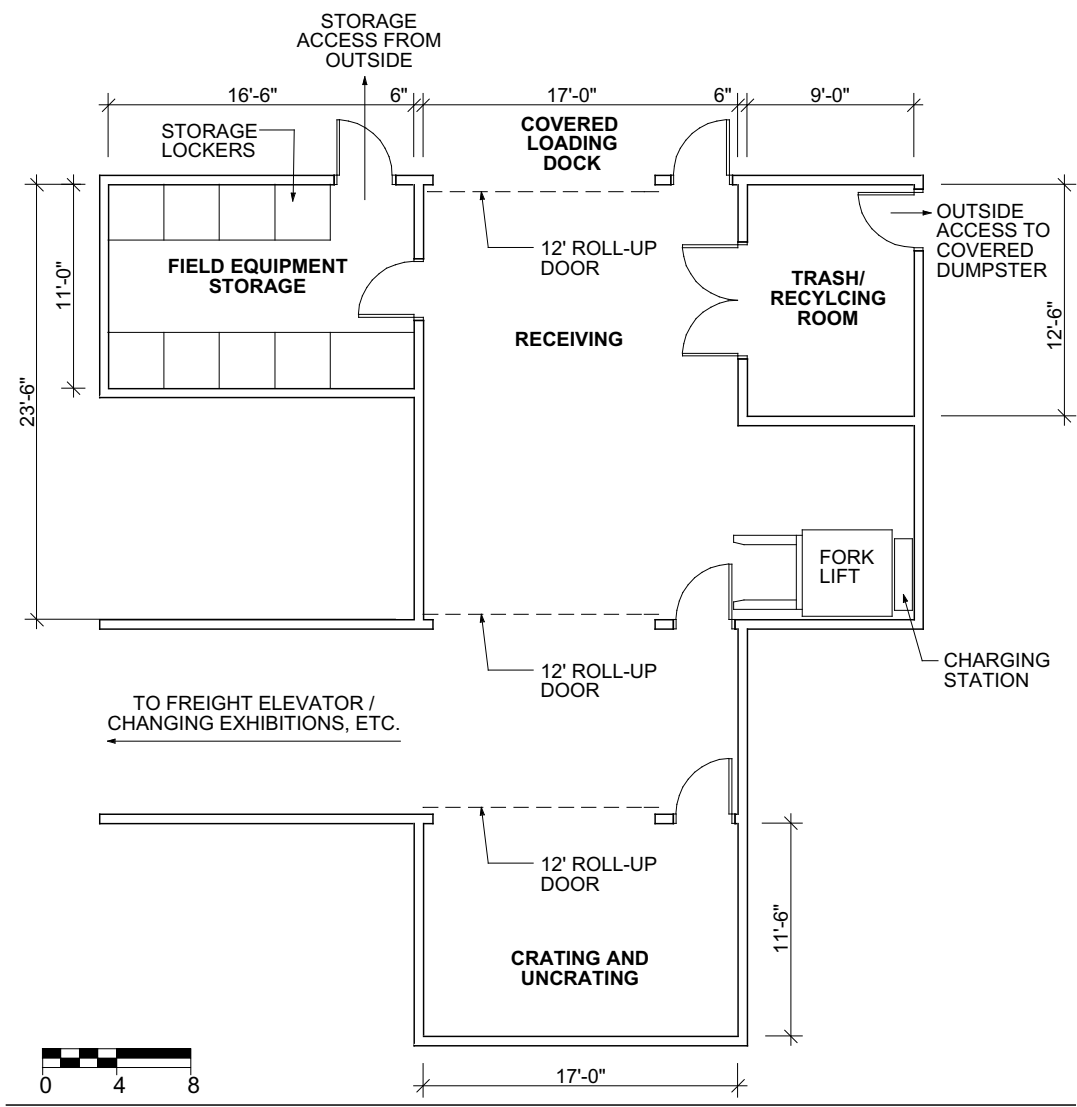
Phone/Data: N/A.

Other:

Furnishings and Equipment: Storage lockers on two walls.

Notes: May be on exterior of building.

Prototype Plan:



Notes:

5.2.1 Main Security Station

5.3.5 Building Services

Description

Function: Security monitoring for Museum.

Capacity: 3 people.

Net Area: 150 nsf.

Adjacency/Access

Adjacent to: Direct access to Receiving Area and Loading Dock.

Access to: View into Receiving Area (either direct or via cc television).

Design Criteria

Architectural

Character: Clean, efficient, and durable.

Openings: Windows above securing counter, two 3' doors.

Ceiling Height/Materials: 9' minimum / Acoustic ceiling tiles.

Walls: Painted gypsum board.

Floors: Carpet.

Other: Built-in counter below windows.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Recessed fluorescent.

Power: Power strip along counter and convenience outlets on other walls. Verify locations with actual equipment.

Plumbing: N/A

Security: High Security (see Electrical Section 4.3.6).

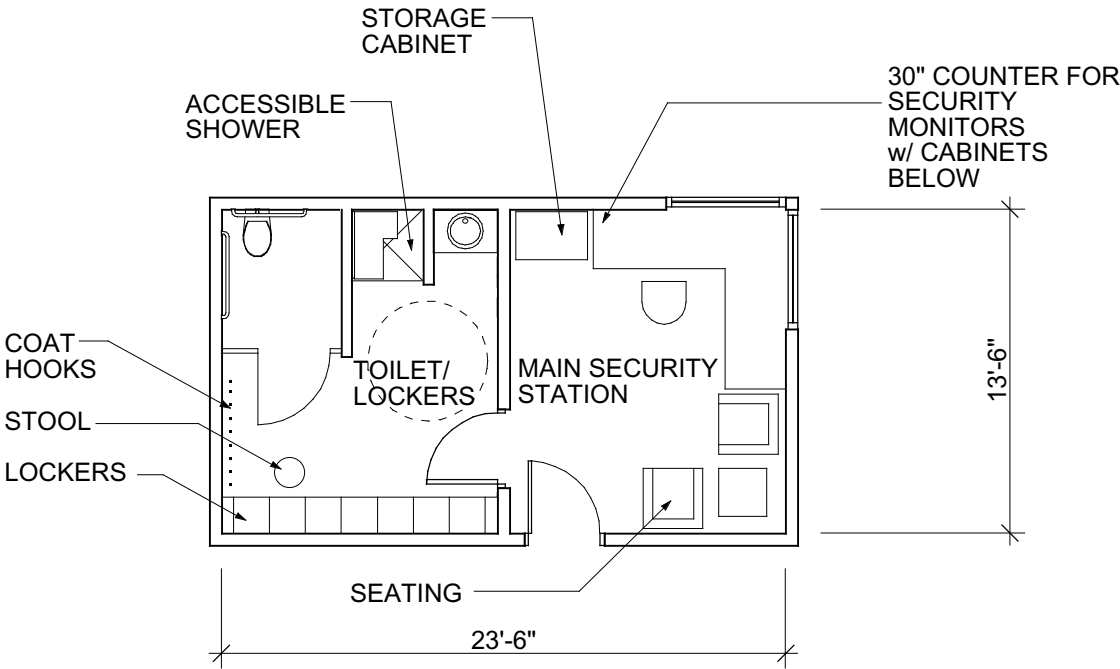
Phone/Data: Intercom to Receiving Area.

Other: Door lock as required.

Furnishings and Equipment: Chairs, storage cabinets. Security systems as required.

Notes:

Prototype Plan:



Notes:

5.2.2 Satellite Security Station

5.3.5 Building Services

Description

Function: Lobby security station.

Capacity: 1 @ 5 sf.

Net Area: --

Adjacency/Access

Adjacent to: Lobby, Lockers/Coats, Visitor Services Storage, Cashroom, Museum Store, Ticket Queue.

Access to: Main Security Station, Administrative Offices.

Design Criteria

Architectural

Character: Friendly, efficient, accessible, consistent with Lobby.

Openings: Open to Lobby.

Ceiling Height/Materials: 12' minimum / Painted gypsum board with acoustically absorptive material where possible.

Walls: Durable and elegant. Stone (preferably local), architectural woodwork, architectural metals.

Floors: Carpet behind counter.

Other:

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D to be verified with final exhibit plans (see Mechanical Section 4.3.3).

Lighting: Suitable for computer station uses (see systems for Lobby).

Power: As required for security system/ticketing systems.

Plumbing: N/A

Security: Coordinated with Main Security Station systems.

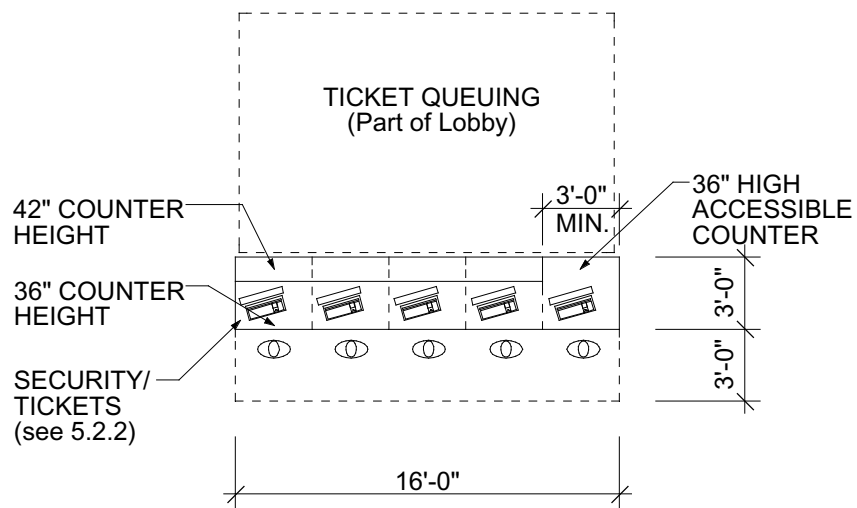
Phone/Data: Telephone and network connections. Clean power.

Other:

Furnishings and Equipment: Cabinetry to accommodate the networked ticketing, ticket printing, cash take, and security functions. Typical elements include: computer screen, keyboard, cash drawer, below-counter printer and small supply storage. May include flyers and brochures in adjacent area.

Notes: Ideally, Security Station electronics would allow flexibility to switch over to full ticketing station during peak ticket times.

Prototype Plan:



Notes:

5.2.3 Lockers/Toilets

5.3.5 Building Services

Description

Function: Lockers, toilets for security personnel.

Capacity: 3 people.

Net Area: 150 nsf.

Adjacency/Access

Adjacent to: Main Security Station.

Access to: Receiving Area.

Design Criteria

Architectural

Character: Clean, smooth, durable, efficient.

Openings: Single 3' door.

Ceiling Height/Materials: 8' minimum / Epoxy painted gypsum board with dropped soffit over sink.

Walls: Ceramic tile.

Floors: Ceramic tile.

Other: Stainless steel partitions and accessories, mirror over sink, shower stall.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D with direct exhaust (see Mechanical Section 4.3.3).

Lighting: Baffled fluorescents over sink. Recessed downlights elsewhere.

Power: Code standard.

Plumbing: Faucets, toilets, shower, drains for sink.

Security: Low Security (see Electrical Section 4.3.6).

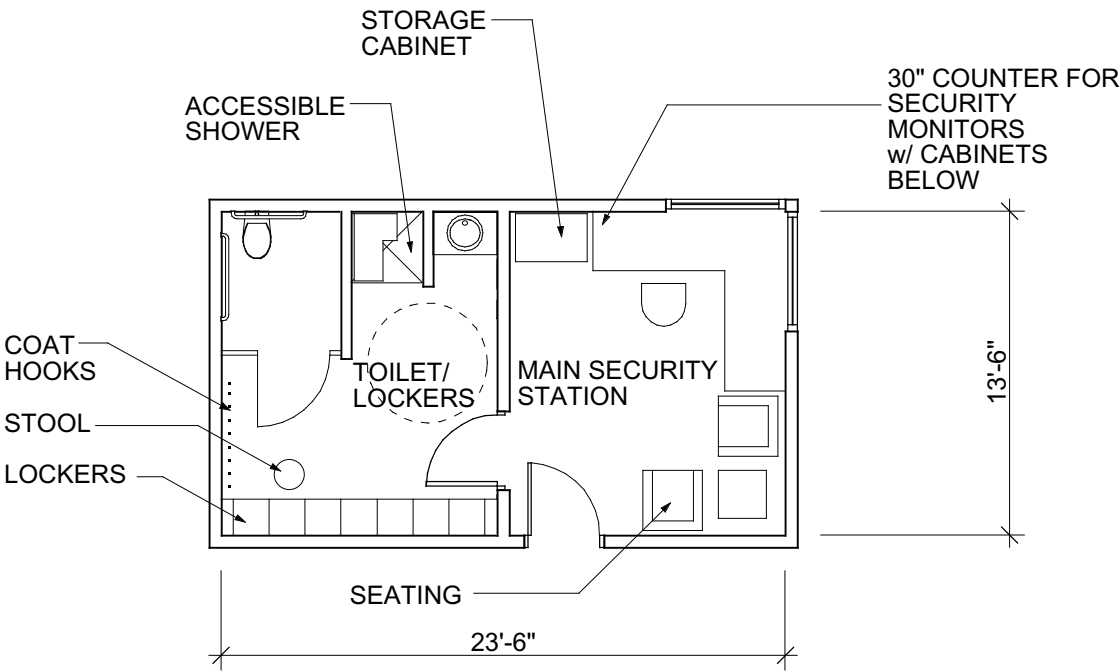
Phone/Data: N/A.

Other:

Furnishings and Equipment: Accessories include toilet paper dispensers, wall paper towel dispensers with internal trash cans. Metal lockers, stool and coat hooks.

Notes:

Prototype Plan:



Notes:

5.3.1 Building Manager Office

5.3.5 Building Services

Description

Function: Office for Building Manager and for the central computerized controls and monitoring of building systems.

Capacity: 1 person.

Net Area: 100 nsf.

Adjacency/Access

Adjacent to: Supply Storage, Equipment Storage.

Access to: Other 5.3.5 Building Services, Receiving Area.

Design Criteria

Architectural

Character: Pleasant, comfortable, efficient.

Openings: Single 3' door.

Ceiling Height/Materials: 9' height / Acoustic ceiling tile.

Walls: Wood trim, painted gypsum board.

Floors: Carpet.

Other: White board.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Indirect ambient, direct task lighting.

Power: 120 v. outlets at walls and below desk.

Plumbing: N/A

Security: Low Security (see Electrical Section 4.3.6).

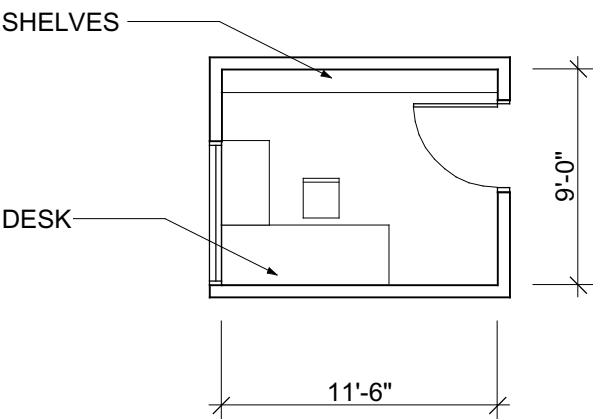
Phone/Data: Two telephone and network connections.

Other:

Furnishings and Equipment: Desk, credenza, shelves, chair.

Notes:

Prototype Plan:



Notes:

5.3.2 Custodial Closets

5.3.5 Building Services

Description

Function: Custodial closets dispersed throughout Museum.

Capacity: --

Net Area: 4 @ 25 nsf each = 100 nsf.

Adjacency/Access

Adjacent to: Toilet Rooms (both public and staff).

Access to: All Museum areas.

Design Criteria

Architectural

Character: Simple, clean, efficient, secure.

Openings: Single 3' access door.

Ceiling Height/Materials: 8' minimum height / Accessible acoustic ceiling tile.

Walls: Durable wood and painted gypsum board surfaces.

Floors: Sealed concrete floor.

Other:

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: N/A

Lighting: Recessed fluorescent downlights.

Power: Code standard.

Plumbing: Floor drain. Floor mop sink.

Security: University standard.

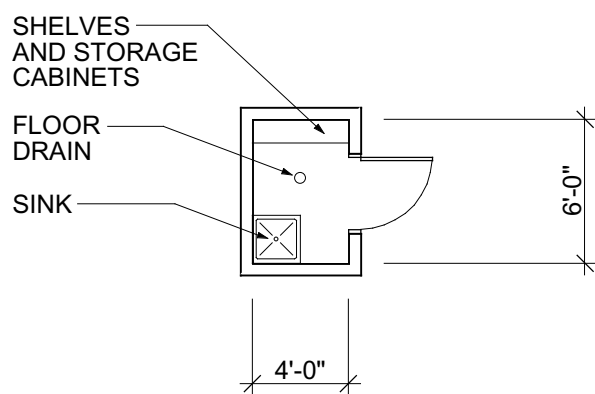
Phone/Data: N/A.

Other:

Furnishings and Equipment: Metal shelving, cabinets.

Notes:

Prototype Plan:



Notes:

5.3.3 Supply Storage

5.3.5 Building Services

Description

Function: Custodial storage for entire Museum.

Capacity: --

Net Area: 150 nsf.

Adjacency/Access

Adjacent to: Building Manager Office, Custodial Closets.

Access to: Custodial Closets in all public and staff areas.

Design Criteria

Architectural

Character: Simple, clean, efficient, secure.

Openings: Single 3' access door.

Ceiling Height/Materials: 8' minimum height / Accessible acoustic ceiling tile.

Walls: Durable wood and painted gypsum board

Floors: Sealed concrete.

Other: Built-in shelf.

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Recessed fluorescent downlights.

Power: Code standard.

Plumbing: N/A

Security: University standard.

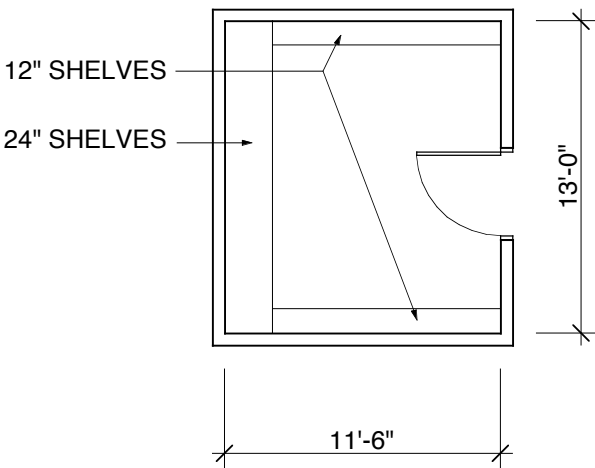
Phone/Data: N/A.

Other:

Furnishings and Equipment: Metal shelving units.

Notes:

Prototype Plan:



Notes:

5.3.4 Custodial Staff Lockers

5.3.5 Building Services

Description

Function: Lockers for custodial staff.

Capacity: 4 lockers in each room.

Net Area: 2 @ 75 nsf = 150 nsf.

Adjacency/Access

Adjacent to: Building Manager.

Access to: Loading Dock Entry.

Design Criteria

Architectural

Character: Clean, smooth, surable, efficient.

Openings: Single 3' access door.

Ceiling Height/Materials: 9' height / Acoustic ceiling tile.

Walls: Painted gypsum board.

Floors: Carpet.

Other:

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Direct fluorescent.

Power: Code standard.

Plumbing: N/A

Security: University standard.

Phone/Data:

Other:

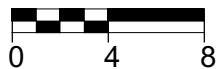
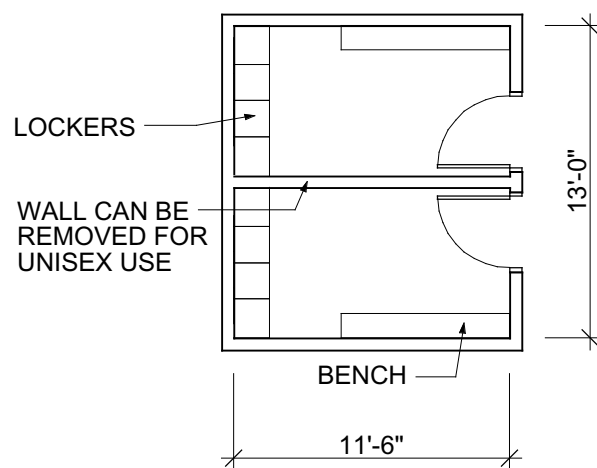
Furnishings and Equipment: Lockers and bench.

Notes: Wall can be removed to become a unisex configuration.

5.3.5 Building Services

5.3.4 Custodial Staff Lockers

Prototype Plan:



Notes:

5.3.5 Equipment Storage

5.3.5 Building Services

Description

Function: Dedicated storage for large maintenance equipment.

Capacity: --

Net Area: 200 nsf.

Adjacency/Access

Adjacent to: Building Managers Office.

Access to: Freight Elevator.

Design Criteria

Architectural

Character: Simple, clean, efficient, secure.

Openings: One pair double 3' doors.

Ceiling Height/Materials: 8' minimum height / Acoustic ceiling tile.

Walls: Durable painted gypsum board.

Floors: Resilient flooring.

Other:

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Surface mounted fluorescent downlights.

Power: Code Standard. Coordinate any charging requirements for equipment (lifts, etc..)

Plumbing: N/A

Security: University standard.

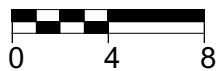
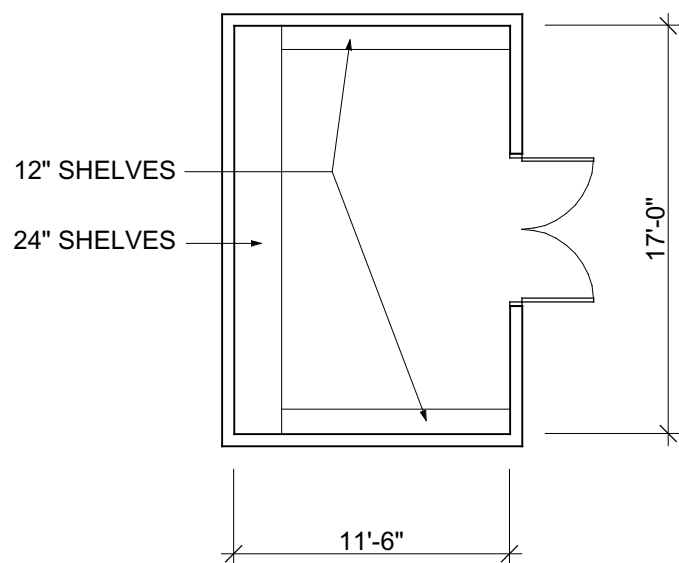
Phone Data: N/A.

Other:

Furnishings and Equipment: Metal shelves, floor cleaning equipment, lifts, etc..

Notes:

Prototype Plan:



Notes:

5.4.1 Grounds / Outside Exhibits Maintenance Storage

5.3.5 Building Services

Description

Function: Storage for grounds/outside exhibit equipment.

Capacity: --

Net Area: 250 nsf.

Adjacency/Access

Adjacent to: Outside.

Access to: Loading Dock, exterior exhibits.

Design Criteria

Architectural

Character: Simple, clean, secure.

Openings: Double 3' doors.

Ceiling Height/Materials: 8' minimum / Painted exposed structure.

Walls: Painted concrete block.

Floors: Sealed concrete.

Other:

Systems

Structural: Building Standard (see Structural Section 4.3.2).

Mechanical: Environment D (see Mechanical Section 4.3.3).

Lighting: Direct fluorescent.

Power: Code standard.

Plumbing: N/A.

Security: Low Security (see Electrical Section 4.3.6).

Phone Data: N/A.

Other:

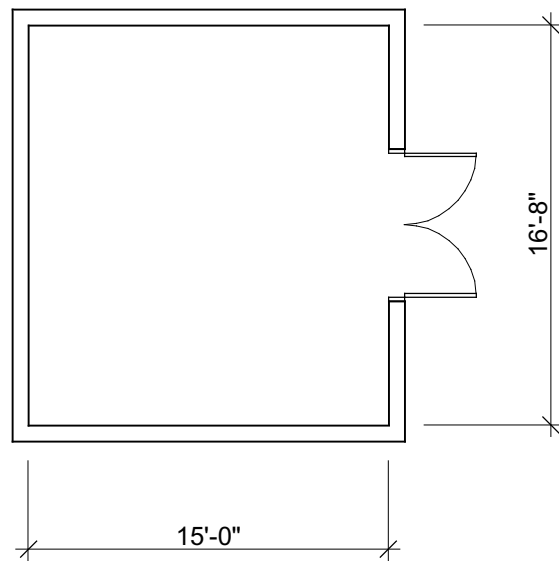
Furnishings and Equipment:

Notes:

5.3.5 Building Services

5.4.1 Grounds / Outside Exhibits Maintenance Storage

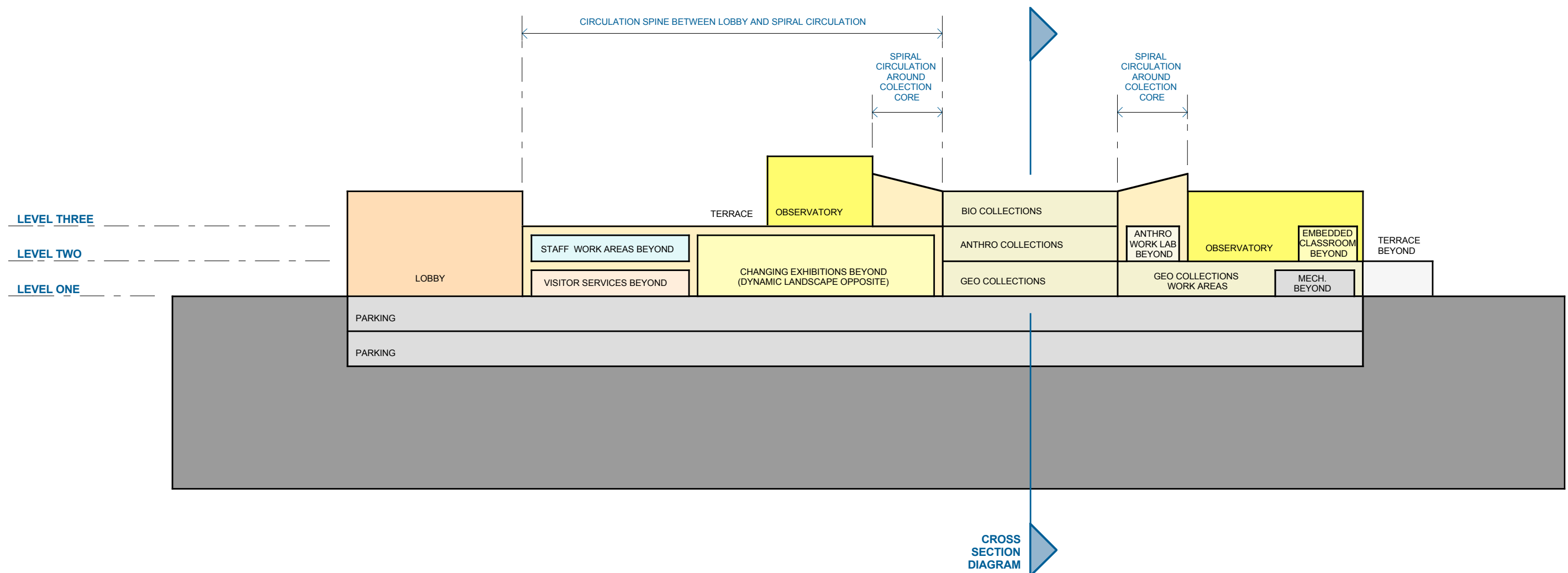
Prototype Plan:



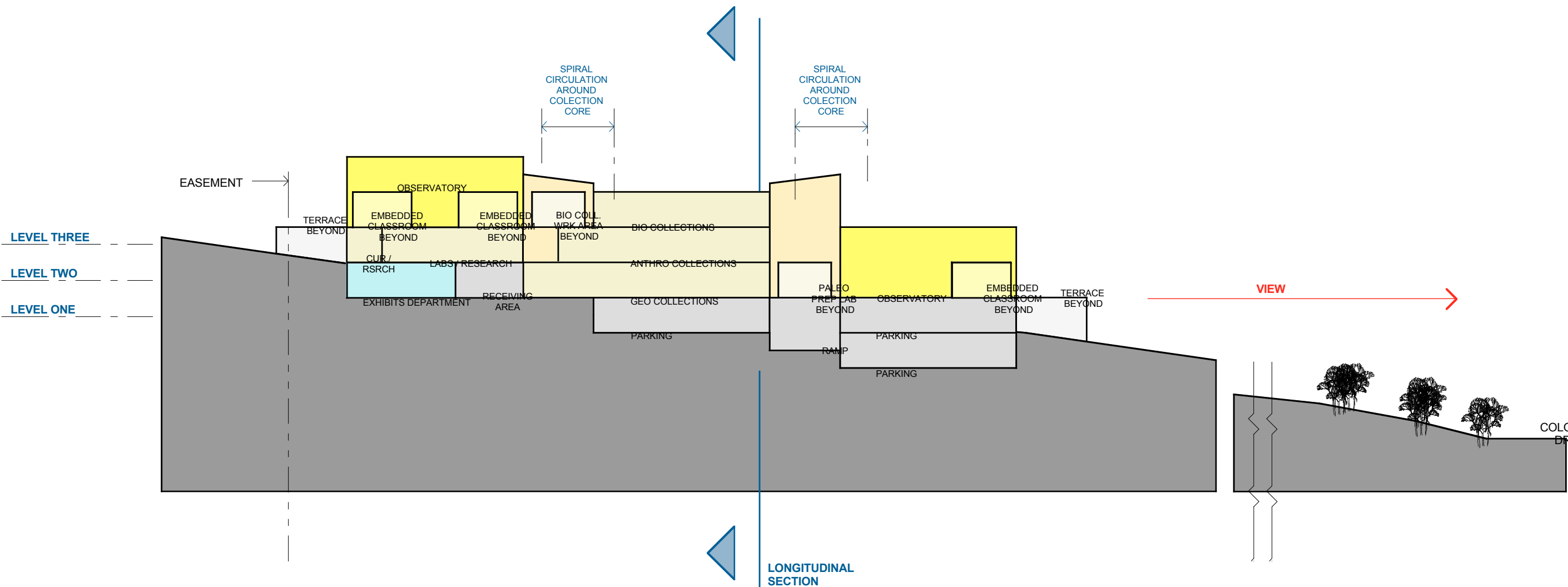
Notes:

5.4 ADJACENCIES / RELATIONSHIPS

5.4.1 Longitudinal Section Diagram



5.4.2 Cross Section Diagram



6.0 EXHIBIT DESIGN CRITERIA

6.1 Introduction

In April 2003, the Utah Museum of Natural History (UMNH), the University of Utah, and the Division of Facilities Construction and Management, acting through Hanbury Evans Wright Vlattas + Company (HEWV), selected Ralph Appelbaum Associates (RAA) to develop an Interpretive Master Plan for the Museum's proposed new facility.

The Interpretive Master Plan is essential in defining the goals, identity, and character of the institution. It is a planning document that guides and shapes the institution's physical and organizational structure; it also describes a vision for the new Museum that can be used as a basis for fund-raising.

This Interpretive Master Plan describes goals, strategies and techniques, and interpretive system elements, and outlines the visitor's experience in the new Museum. Together with the Architectural Program prepared by E. Verner Johnson and Associates and the Site Master Plan prepared by HEWV, this document lays the groundwork for the design process that will follow over the next few years.

At the core of this effort is the development of a unique institutional model, an organizational strategy that will inform the nature of the architecture and the use of the site. This model is a radical departure from traditional natural history museums, signaling the Museum's intent to become an innovator and to remain contemporary and relevant. The Museum will not only preserve the artifacts of the past, but will become a shaper of the future - of knowledge, culture, and values.

6.2 Executive Summary

RAA's unique planning process begins with a deep immersion into the Museum's context, collections, culture, and competitors -- and in this case, into the state itself. In this Discovery Phase RAA toured city and regional institutions, met with Museum staff, the Indian Advisory Committee, University faculty, leaders of cultural and civic institutions, education policy makers and teachers, and Museum stakeholders. We toured the Museum, both front- and back-of-house, and visited possible institutional competitors and collaborators.

We heard exciting ideas and aspirations:

- "We live in the most amazing state in the Union."
- "The museum needs to have people on the floor whose enthusiasm is infectious -- to spread the word."
- "The power of natural history is its holistic view of the world."
- "For museums to be agents of positive change they need to take on controversial issues."
- "The museum should be a safe place for dangerous dialogue."
- An issues focus would "unfreeze museums."
- The museum should foster a "heartbeat sense of place with respect to the biosphere, geosphere, and hemisphere."
- "Why not be bold?"

By delving deeply into its base of assets and understanding its unique opportunities, the Utah Museum of Natural History now has the opportunity to reinvent itself from the inside out. By building from the ground up on a dramatic new site, the Museum will become more accessible to a broader range of visitors, update its content, and create a compelling set of new and changing visitor experiences. By showcasing a currently under utilized asset, the collections, the Museum can offer its visitors an experience of the real, and tie abstract concepts to concrete objects. In its new location, the Museum will continue to be vital to the University of Utah, with more extensive research facilities and additional faculty offices. The Museum's offerings for school groups and children will be expanded, reaching out to the state's growing young population. Through deep connections and partnerships, the Museum will forge links to the University, local institutions, and communities around the state. The new UMNH will become the gateway to the state's natural wonders -- the place to start your journey, and to return again and again to continue exploring.

6.3 Institutional Philosophy

6.3.1 Museum Mission Statement

The Museum's existing mission statement serves as a foundation for consideration of what the Museum is today and what it aspires to be.

The Utah Museum of Natural History illuminates the natural world and the place of humans within it.

6.3.2 Interpretive Goals, Principles, and Scope

6.3.2.1 Goals

- Foster new ways of thinking about our relationship to the natural world and how we live our lives.
- Encourage a sense of discovery in all visitors.
- Serve as a resource for planning the region's future.
- Leave visitors with a sense of wonder about the natural world and their place in it.
- Invite visitors to engage in the process of science, and show by doing that everyone can be a scientist.

6.3.2.2 Principles

- Inspiration
- Inclusion
- Involvement
- Interactivity
- Interdisciplinary

6.3.3 Interpretive Scope

The new Museum will concentrate on interpreting the Intermountain West. The bulk of the collections are from this region, and it is where most of the current fieldwork takes place. The Museum will act as a portal or gateway to the natural and geologic beauties of the state and region; the goal is to inspire visitors to go out and see for themselves, informed by their visit to the Museum. UMNH will be designed to appeal to visitors of all ages, and seeks to encourage lifelong involvement in the Museum.



6.4 Assets and Opportunities

“One’s destination is never a place but rather a new way of looking at things.”

— Henry Miller

During the Discovery Phase, RAA met with UMNH staff and board members, University faculty and administration, friends of the Museum, and state and local agencies in a series of wide-ranging discussions about the potential and possibilities for the new Museum. The intent was to explore UMNH’s existing assets, and discover how its positioning and programs might evolve in a new setting and building. This “discovery” phase is invaluable to a museum planning effort, and in this instance provided many key insights and ideas.

6.4.1 People

UMNH brings a number of assets to the project, including expert and enthusiastic staff, an active and involved board, and dedicated docents and volunteers. This “people factor” is the glue that holds the project together. One of the considerations in developing the Interpretive Master Plan was how to bring the staff’s contributions and skills to the forefront of the visitor experience. The plan proposes layering public spaces and labs, demonstration areas and classrooms, and providing windows into work areas traditionally considered “back-of-house” to allow visitors behind the scenes. The new Museum will feature the work of past and present staff, and will celebrate the doing of science.

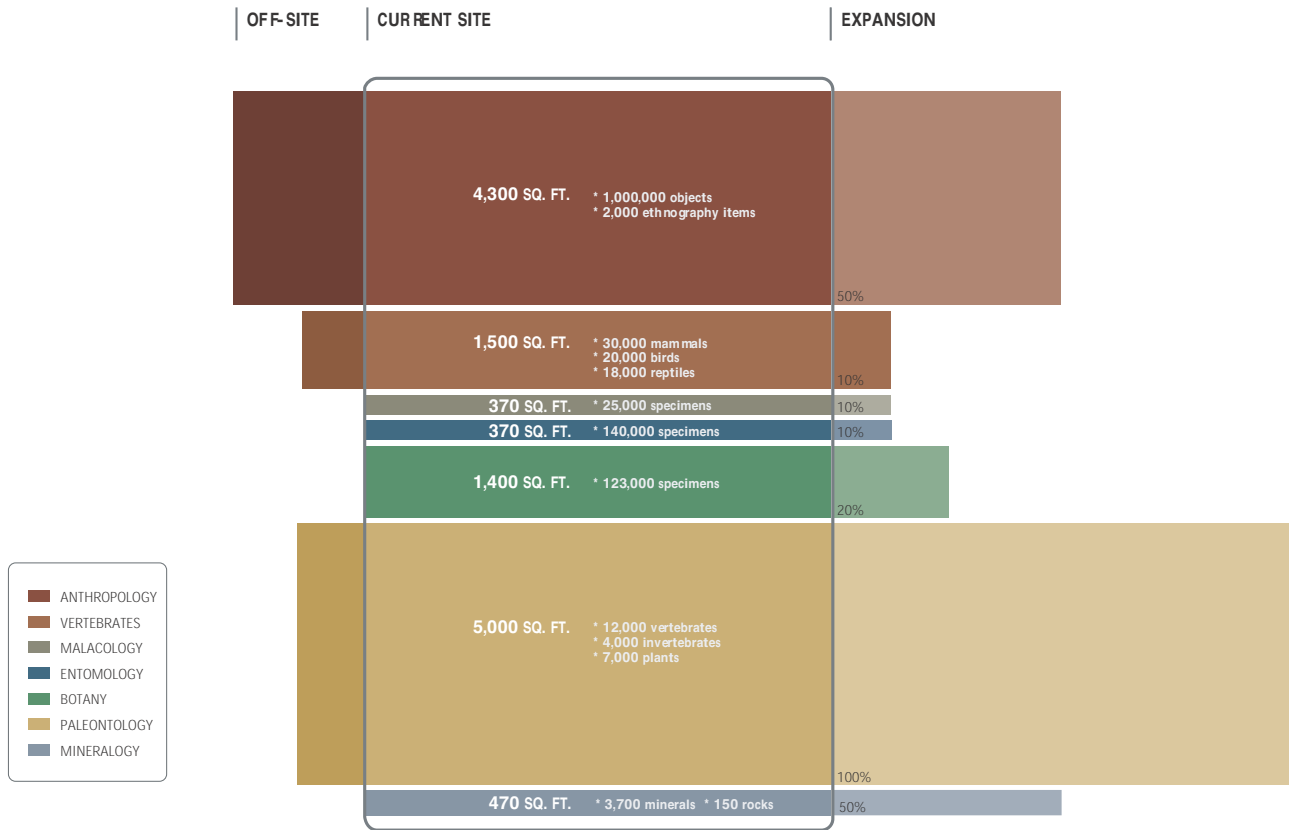
6.4.2 University of Utah

UMNH is further strengthened by its ties to the University of Utah. We have been looking for ways that the Museum can maintain and invigorate its connections to the University and take better advantage of the University’s lively intellectual community. We will not be “out of sight, out of mind” at the new site. In fact, the expanded Museum will facilitate research and academics with additional labs and faculty office space.

6.4.3 Collections

UMNH’s collections are the largest scientific holdings in the region, yet fewer than one percent of them are currently on display. They include more than one million objects from the Intermountain West; the Museum is Utah’s state museum and, as such, is the steward for objects collected from state lands. Seventy-five percent of the collections were found on federal lands. The collections speak to the geologic, biologic, and human history of the region; they are rich, diverse, and often fragile.

We will build into the new Museum ways to display more of the collections. The Interpretive Master Plan centers the new Museum around a “collections core” of visible and closed storage, revealing and celebrating these greatest of assets. We will emphasize that the collections are actively used in ongoing research projects, and bring collections to the foreground in preparation and work areas. We will create new and unexpected encounters with objects.

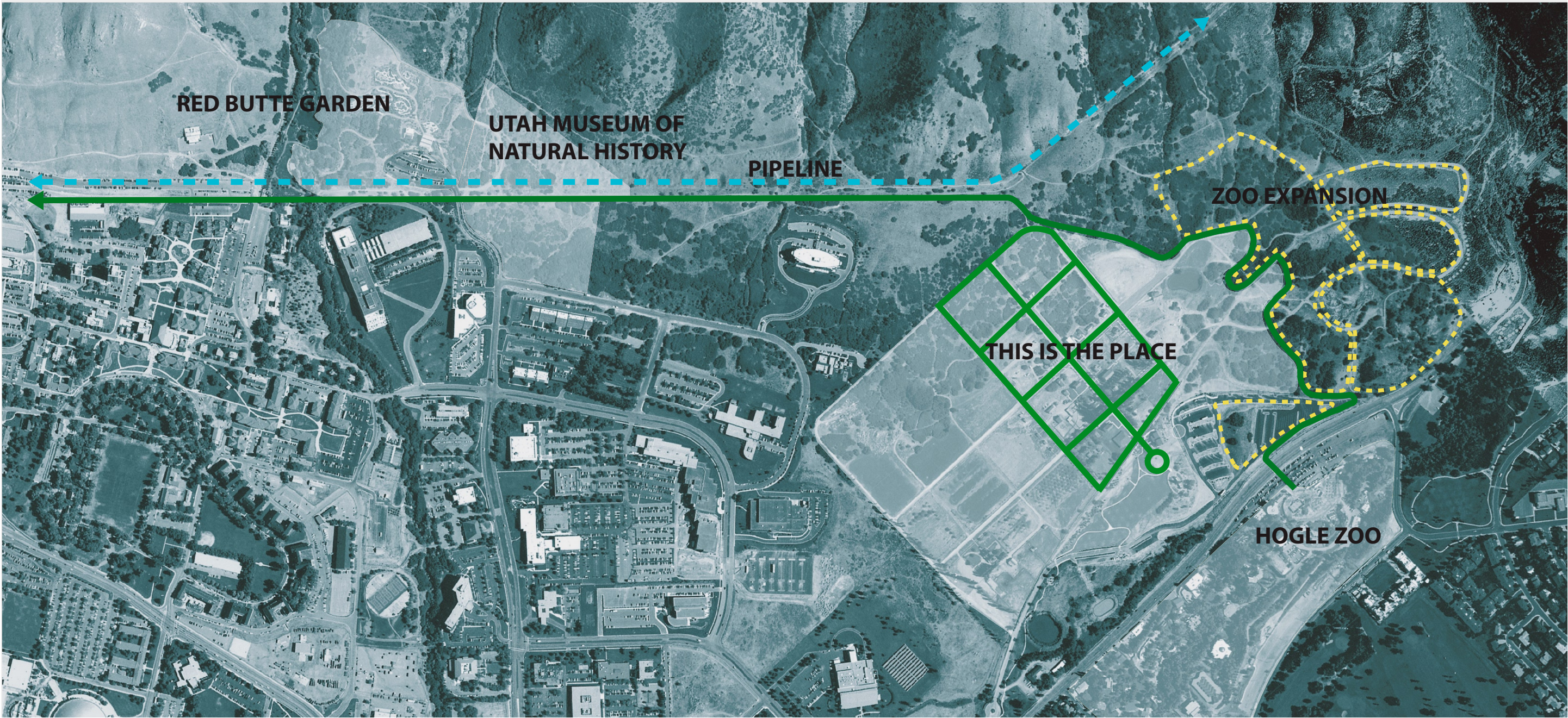


Existing Collections and Projected Expansion

6.4.4 Site

The new 14-acre site sits above Research Park next to Red Butte Garden. The land is at the edge of the city, against the foothills and 600 acres of wild lands under a conservation easement. The site offers spectacular views of the city and the Wasatch, Oquirrh, Stansbury, and Lakeside mountain ranges. We intend to use these vistas, or viewsheds, to support the content and themes of the new Museum. The site is the natural place to watch weather roll in over the lake, spot migratory songbirds heading up the canyons in the spring, and look deep into the Pleistocene sands of Bonneville Beach under the site. We intend to elevate public consciousness of the site's deep history, and anchor the visitor experience to a sense of place.

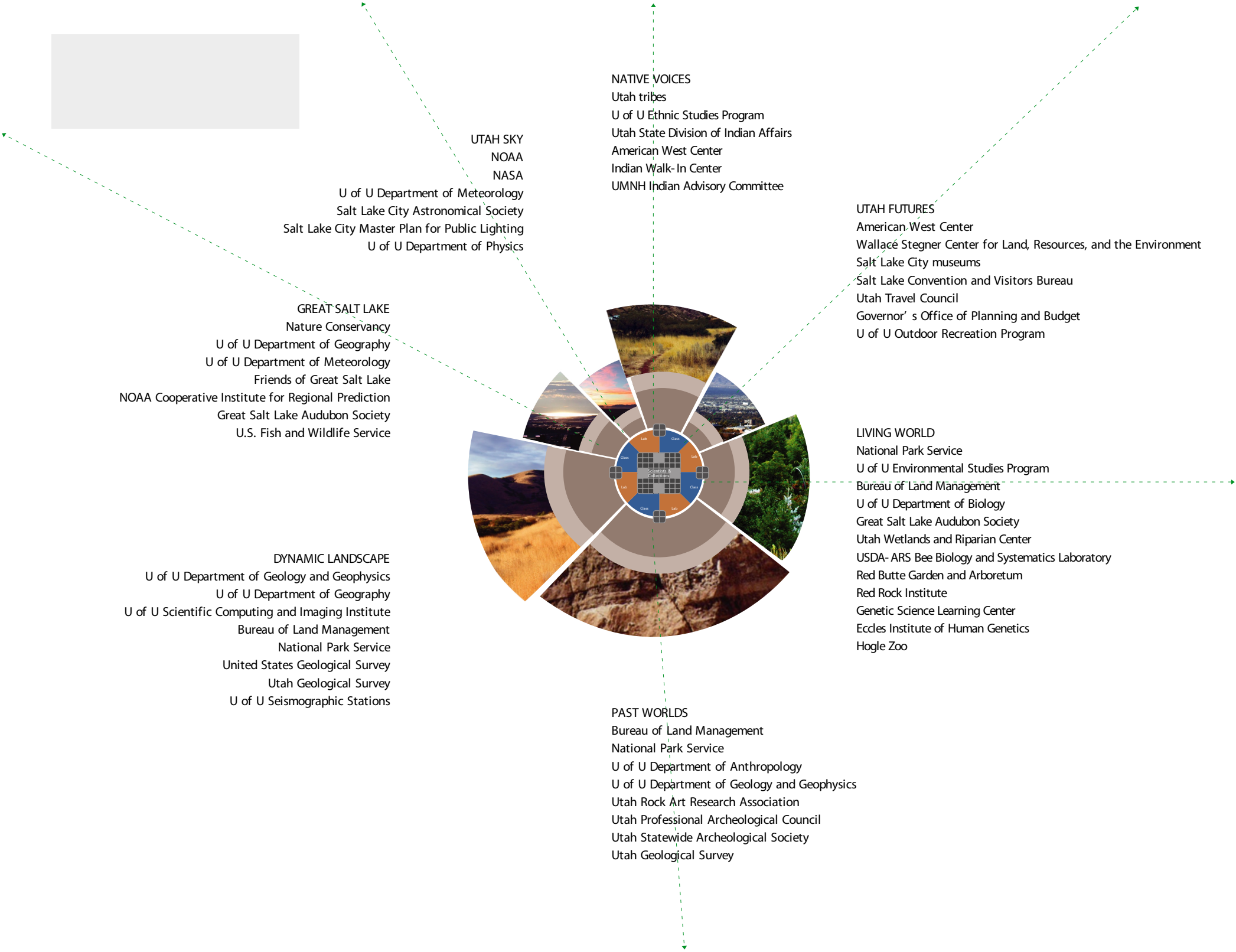
The popular recreational Bonneville Shoreline Trail runs through the site, and will remain. The Museum is looking for ways to appear to and accommodate the trail's users, perhaps through outdoor seating, bike racks, water fountains, and café access. The site's natural vegetation will be respected, and native plants restored to the site. Any building on the site will incorporate high standards of sustainability and "green" building.



6.4.5 Partnerships and Connections

The Museum has new neighbors with compatible missions and audiences; these Emigration Visitors District neighbors are particularly attractive potential partners. The Museum is exploring joint programming and facilities with Red Butte Garden. The Hogle Zoo has expressed eagerness to cooperate in developing exhibits and live animal support. With This is the Place Heritage Park, these institutions are exploring joint transportation options. The Museum is also investigating collaborations with University faculty and centers, and local and regional institutions.

The new Museum will build on existing relationships with local and regional institutions. As a portal to the state of Utah, the Museum will emphasize its connections to sites and attractions around the state. These connections form part of an interpretive trail network that links the new Museum and stretches out to the state’s parks, visitor centers, and cultural institutions. The Museum is a state museum, and needs to reach out beyond the Wasatch Front and appeal to all of the state’s diverse residents.



Connections



6.5 Institutional Model

“All our knowledge has its origins in our perceptions.”

— Leonardo da Vinci

The Interpretive structure of the Utah Museum of Natural History is built on a unique institutional model -- a set of metaphorical lenses and observatories radiating outward from a core of collections resources. Most museums keep collections, staff, and the research they do hidden; the new Museum will bring them forward, and in doing so, will serve as a wonderful model for young people.

The fundamental process underlying all the sciences is human observation; we observe to test hypotheses. For thousands of years, humans have studied the world around them with ever more sophisticated tools, forming ideas about how the world works, creating myths, art, and poetry, as well as science. Observation and understanding enhance our appreciation of the world around us and expand the frontiers of our knowledge.

In the new UMNH, we will bring traditional and cutting-edge lenses, tools, and technologies to bear on the natural world in a series of observatories. Our observatories will give visitors different, yet interrelated, views of the natural world. Visitors will be able to go to places they could not otherwise visit (inside a cell, back to the Cambrian), and will see both macro and micro views, and different viewpoints. They will observe with all their senses, not just their eyes, and will not just look, but see. We will bring meaning to what visitors look at in the Museum and to what they read about every day.

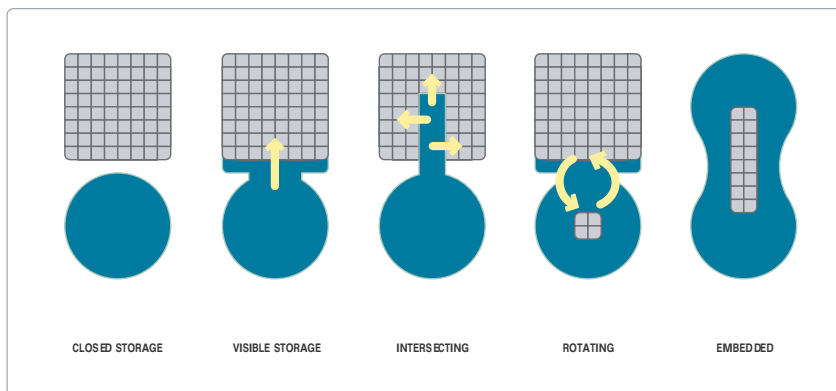
6.5.1 Collections Core



“Core:

1. the central or innermost part of anything
2. the most important part, as of a matter, discussion; essence, pith”

The Museum's collections will form the core of the new building and represent a significant percentage of the program area. Rather than tucking this part of the program away, it should be proudly displayed as a central core of objects in both compact and open-storage formats; visitors will be able to see much of the collections along the perimeter of the core. Visitors will move up through the collections core to access observatories, labs, and classrooms. These are organized as concentric layers moving from the inside to the outside, from the opaque to the transparent.



Collections Integration

6.5.2 Prep Labs, Demo Areas, and Classrooms

Surrounding the collections core, a layer of prep labs and state-of-the-art classrooms acts as a bridge between the collections stack and the observatories. Individual classrooms supplement each observatory's capabilities. This heavily staffed layer of programs will interact with the collections core and make transparent the processes of conservation, study, and interpretation. The goal is to celebrate the hands-on doing of science, and allow visitors to participate.

While the theme observatories themselves will not vary over time, elements within them may, as may the trails. The lenses may be changed; the research lens, in particular, should be regularly updated to reflect the latest work of Utah scholars. The trails may also change -- they may have different underlying themes, and may include different elements in each observatory. Finally, the built-in flex space in each observatory allows UMNH to program and update content. It is also expected that the living elements of the project will be switched out periodically, and that the observatories backed by the most active UMNH research programs will change frequently.

6.5.3 Observatories

"Observatory:

1. a building fitted with instruments for making systematic observations of any particular class or series of natural phenomena (as in astronomy); also: an institution whose primary purpose is making such observations

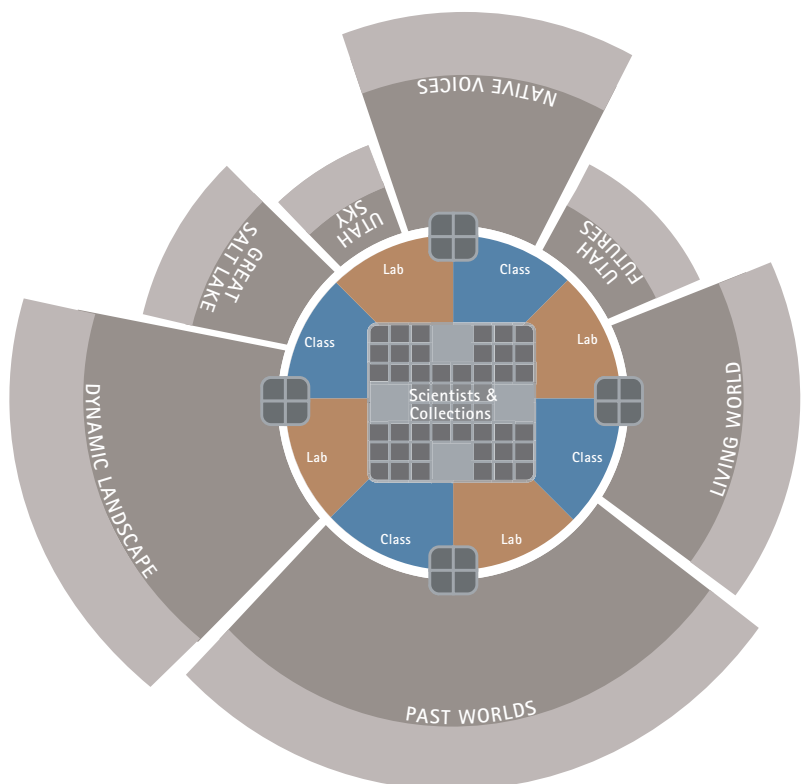
2. a situation or structure commanding a large view”

The observatories are a series of indoor/outdoor platforms that elucidate various themes and issues related to the natural world. The themes are chosen to illuminate the wonder of the natural world, to illustrate the place of humans in it, and to encourage a rethinking of how we live as humans in this place, this region, and this planet.

Observatories imply an outward focus; they look out at the natural world, and view into the past and into the future. Although their focus is outward, the observatories are anchored to a collections core.

Collections are used differently in each observatory: there may be visible storage, collections access, and demonstration areas.

The seven unique observatories (Dynamic Landscape, Past Worlds, Living World, Native Voices, Utah Sky, Great Salt Lake, Utah Futures) are each oriented toward a terrace – an outdoor space carefully positioned to frame a view of the site and the surrounding landscape that is particular to that observatory’s interpretive scope. These can be defined by the strategic location of windows and walls of the building, extending the galleries outward and upward to include outdoor areas, capturing the sky above. A portion of each observatory is undeveloped flex space. This space is “mothballed” for future exhibit expansion, and can be used in the interim as a layer of special partnership opportunities, rotating content, and educational programs.



Observatories Diagram

“The real voyage of discovery lies not in finding new lands, but in seeing with new eyes.”

— Marcel Proust

6.5.4 Viewsheds

Each observatory capitalizes on a unique vista, or viewshed, connecting the content of the observatory with specific views of the surrounding landscape. These can be defined by windows and walls of the building, extending the galleries outward and upward to include outdoor areas, capturing the sky above, zooming in on the flora and fauna of the site, zooming out on the city, or framing the Great salt Lake and the horizon beyond.



Viewsheds Diagram

6.5.5 Lenses

“Lens

1. something that facilitates and influences perception, comprehension, or evaluation”

Each observatory has a unique set of lenses that provide perspectives and insights. Lenses are used to heighten the visitor experience, and to take visitors to places and viewpoints they can’t go to otherwise (such as back in time or into an osprey’s nest). Lenses may be physical tools -- telescopes, microscopes, magnifying glasses. Lenses are also intellectual tools that allow us to provide macro big-picture views, micro insights and analyses, and varied and surprising viewpoints. Each observatory has a standard set of micro and/or macro lenses, and a special tool or lens that provides the main viewpoint. For instance, in the Dynamic Landscape Observatory, a “time-collapse lens” compresses deep time so visitors can see the formation of the Intermountain Region; microscopes and hand lenses focus on mineral structure; while research lenses show the work of UMNH and U of U scientists.

“Where the telescope ends the microscope begins. Which of the two has the grander view?”

— Victor Hugo

6.5.6 Trails

“Trail

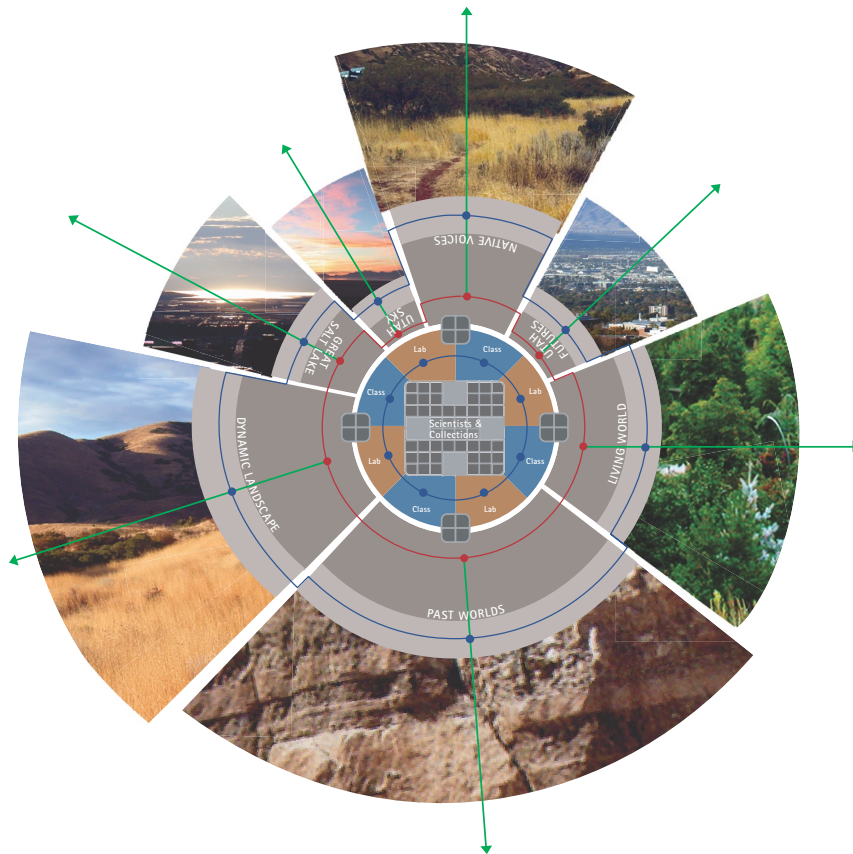
1. a mark, footprint, scent, etc., left by a person, animal, or thing that has passed
2. a path or track made by repeated passage or deliberately blazed
3. evidence pointing to a possible solution
4. a course followed or to be followed”

Each observatory stands alone as a visitor experience; they are linked by a set of paths or trails that lead outward from the collections core. The paths invite visitors to join a certain sequence of experiences, or to create their own; they give structure to the messages of the observatories. The trails set up cognitive pathways through the observatories, not just physical ones. They also lead out to sites and partner institutions, with the goal of encouraging a lifetime of learning and exploring.

The trails help visitors create their own intellectual content map, or help them discover a map we have created for them. The new Museum’s wayfinding system may include trailheads, physical paths, maps, guidebooks, and signposts. The trails are easy to follow and they offer a variety of experiences. The trails make sense thematically -- each tells a different story that visitors discover along their way.

Visitors can break new trails for themselves or follow in others’ footsteps. They can create personalized paths using a digital “trailtik” interface. Trails may have guides, whether actual explainers or virtual avatars.

One trail might be a “path of least resistance” through the Museum’s exhibit highlights and best vistas. A literature trail might take visitors to Wallace Stegner in the Great Salt Lake Observatory, John McPhee in the Dynamic Landscape Observatory, the poetry of Wallace Stevens or William Carlos Williams in The Living World Observatory, and could lead out to the salt Lake City Library; the literature trail could feature also the world of the write-in-residence jointly sponsored by UMNH and the University’s English Department.



Trails Diagram

“ To move the world we must first move ourselves.”

— Seneca

“To follow a trail is to establish a link with the history of man.”

— Lennon Hooper

6.6 Visitor Experience

In the conceptual scenario, most visitors will enter the building at a lower level by car and move upward through the building to the lobby. A dramatic open space with visible storage bays reveals the collections core. Visitors circulate upward, spiraling skyward to the observatory levels. At the top, the Utah Sky observatory also serves as a majestic banquet hall with dramatic views out over the landscape.

As visitors move up through the open space they are able to move outward and pass through the collections core at various points. A system of suspended walkways along the outer edge of the collections stack could allow visitors to interact with the collections at a variety of levels and see the extent of the stack as a volume, enclosed by glass. These walkways are also bridges between collections areas and labs. Visitors will have a heightened sense of the Museum's inner workings - the ongoing work of curators, a wide variety of educational programs, and exhibit design and construction.

The walkways bridge over single- and double-height observatories. Each observatory offers visitors a distinct set of interactive, multidisciplinary experiences. Visitors will see live plants and animals, and will be able to move seamlessly between indoor areas and associated terraces and gardens. In the labs embedded in the observatories, visitors will be able to do hands-on science and make observations, exploring for themselves the process of science. Multimedia events will reinforce the experience of the real collections and the site. Dramatic viewsheds radiating outward connect visitors to the site and the landscapes beyond.

Above all, the new Museum is layered and complex -- it offers a rich palette for first-time visitors; and return visitors will find new and in-depth experiences. Visits will spark passions and feed existing passions; visitors can choose to wander through the observatories, blazing their own trail, follow an existing trail, or even change trails during their trip. Some trails may be subject-based (paleontology, anthropology), while others weave together elements into broader themes. These might include a Utah Heritage Trail and an Arts and Letters Trail. The trails all originate at the collections core, and lead out through the observatories to outdoor gardens and experiences on the site and thence out to the city, state, and region.

For instance –

Salt Lake City residents bringing visitors might choose to follow the highlights trail, or “path of least resistance.” This will lead them through a story of ecology and evolution featuring the Museum's treasures, and most spectacular views.

Dino fans and archaeology buffs might select the “time traveler trail,” which leads them through Dynamic Landscape to Past Worlds, with a side path to Native Voices; this trail connects also to UMNH field sites and Utah paleontology sites such as Dinosaur National Monument.

School groups will find much to discover, and teachers will find that the Museum's support of science curricula continues: fourth-graders can explore the Great Salt Lake Observatory, while seventh- and eighth-graders can learn more about cells and genetics in the Living World's genelab.

The “eco-adventure” trail is about the Earth and humans’ place on it. It takes visitors from Dynamic Landscape to Past Worlds, where they see the Earth before man, and the coming of man, to current regional examples of land use in Great Salt Lake. Eco-adventurers can end their visit by planning scenarios for the Salt Lake region on the giant interactive map.

Encouraging a love of science in all ages, an activity trail takes children and families to a series of hands-on labs and activities -- they can explore the chemistry of water, pat a peccary, or watch bee behavior in the vivarium. Families will learn skills together, and will become engaged in the process of science through experimenting and observing.

6.7 Interpretive Program

6.7.1 Orientation Theater

First-time visitors will see a 10-minute-long film that flies over the state's unique landscape to zoom in on field sites, and soars over the Wasatch Front onto campus, where it zooms into University labs and classrooms to highlight research and teaching. Finally, the camera flies over the site of the new Museum, and recaps its history, features and viewsheds.

Time-lapse footage of the building's construction shows how the Museum is organized and how it sits on the site. The film includes the words of poets, artists, and scientists describing the state's beauties and distinctive features. The film gives visitors an immediate sense of place, and conveys the message that the Museum and University are working to increasing our knowledge - to help us understand the world today and to plan wisely for our future. Finally, it focuses on the MUSEUM experience and an individual's options for taking this journey...and if necessary, the underlying concepts that tie it together.

Adjacent to the theatre, a set of exploration, or "trailtik," stations allows visitors to tailor their journeys within the museum to their interests, guided by a customized digital or printed map.



6.7.2 Dynamic Landscape Observatory

-- explores the changing landscapes we live in

In the Dynamic Landscape Observatory, time is manipulated, allowing visitors to see deep into the Earth's past. They will see how the region formed and evolved, and how human, seismic, and abiotic impacts continue to shape the landscape. This observatory seems of the Earth, and looks below the building and into the site to reveal the "Bonneville Beach" and Wasatch Fault. Visitors leave wanting to explore Utah, with eyes open to a new understanding of the state's amazing geologic features.



6.7.2.1 Dynamic Landscape: Interpretive Scope

Theme The surface of the Earth has changed over millions of years and continues to change; this change impacts humans, just as humans impact the landscape.

Lens The lens in Dynamic Landscape is an intellectual digital tool that stretches and compresses deep time, giving visitors a visceral sense of the enormity of geologic time, and allowing them to see the formation of the region and the state over millions of years.

Topics geology of intermountain region
landscapes shape communities
human impacts



physical geology
cartography
structural geology
Utah focus: Utah geology and landforms
Broader impacts/issues: extractive industry;
reservation and land management
UMNH and University research: discovery of new
minerals - Paula Wilson; "geoantiquities" -- Marjorie
Chan; Lake Bonneville -- Don Currey; Elliot Lips;
Katrina Moser

Collections Usage

70% mineralogy
10% paleontology
5% vertebrates
5% anthropology
5% entomology
5% malocology

Media time machine
digital imaging of Earth processes

Timeframe
deep time (formation of Earth to present)

Art/Literature/Music
literature -- John McPhee, Clarence Durrón
art -- Robert Smithson

Partners U of U Department of Geology and Geophysics
U of U Department of Geography
U of U Scientific Computing and Imaging Institute
Bureau of Land Management
National Park Service
United State Geological Survey
Utah Geological Survey
U of U Seismographic Stations

Site Connections
Timpanogos Cave National Monument
Arches National Park
Capital Reef National Park
Bryce Canyon National Park
Canyonlands National Park
Zion National Park
Natural Bridges National Monument
Rainbow Bridge National Monument
Kennecott Mine

Grand Staircase Escalante National Monument
 Zion National Park
 Cedar Breaks National Monument
 Sheep Creek Canyon Geological Area (Ashley
 National Forest)
 Red Canyon Visitors Center, Flaming Gorge
 National Recreational Area
 Snow Canyon State Park
 Kodachrome Basin State Park
 Coral Pink Sand Dunes
 Drive from Delta to Baker, Nevada
 Thistle Landslide, Highways 6 and 89
 Skyline Drive, Wasatch Plateau
 Mirror Lake, Uinta Mountains
 Goblin Valley State Park
 Great Basin National Park, Nevada

6.7.2.2 Dynamic Landscape: Program Components

Relative Size

medium

Viewshed

into the Earth and Wasatch fault

Size

exhibits 4,500 sf

education 600 sf

outdoor 1,200 sf

Classroom

rocklab

Collections Viewing

visible storage of mineralogy collection

Other Artifacts/Objects

casts of Utah landforms

new collection of representative Utah rocks
and minerals

Outdoors

landscape of large rocks and minerals

Adjacent Observatories

Past Worlds, Great Salt Lake

6.7.3 Past Worlds Observatory

-- reveals how scientists reconstruct the past, and shows the processes of recreating ancient worlds

This observatory is a hub of paleontological and anthropological activity, a privileged “behind the scenes” look at how scientists piece together information gathered through field and lab work to project backward in time and re-create past worlds. A constant flurry of activity and movement of new materials through this observatory reflects the major undertaking of UMNH’s scientists, volunteers, field crews, and graduate students -- the science and art that it takes to imagine and re-create bygone worlds. Rather than build traditional static dioramas, we will design these re-creations as works in progress, constantly updated with new information through a combination of rotating specimens, new finds, and changing environmental visualizations - emphasizing that science, and our knowledge of the world, is always changing. The centerpiece of this observatory is a very large paleo-prep lab visible from above. It is surrounded by, and feeds, exhibits and immersive environments that re-create six views into Utah’s past. Visitors tread differently upon the Earth knowing who has come before them in the trail of life on the planet.



6.7.3.1 Past Worlds: Interpretive Scope



Theme The story of evolution links all Earth’s life; understanding this story is critical to understanding our place in the world.

Lens A process lens emphasizes the science of paleontology, from discovery and excavation to cladistic and functional analyses. In this observatory,

the highlight is a large prep lab and staging area where workers are assembling dinosaur mounts and components of dioramas. There will be lenses trained at six periods in the past: Cambrian, Jurassic, Cretaceous, Eocene, Pleistocene, and Holocene.

Topics evolutionary processes
evolutionary relationships
ecology
extinction
origin of life
how scientists reconstruct the past
Utah focus: six windows into Utah's past: Cambrian House Range, Jurassic Cleveland-Lloyd Quarry, Cretaceous GSENM, Eocene Uinta Basin, Pleistocene Bonneville basin, Holocene (Utah's dry caves, framing transition at Vernal Torrey-Teasdale or Clear Creek, development and abandonment of farming Range Creek and other sites)
Broader impacts/issues: current extinctions
UMNH and University research: integrated investigation of past worlds -- Scott Sampson; new theories about Cleveland-Lloyd quarry; how archaeologists reconstruct prehistoric lifeways — Duncan Metcalfe; archaeology as a science — Jesse Jennings; Frank Brown, Tony Ekdale

Collections usage

65% paleontology
25% anthropology
5% mineralogy
5% botany

Media time machine
virtual dig/"be an archaeologist" game
live connections to field sites

Timeframe
geologic time (first life on Earth to present)

Art/Literature/Music
science/art meet in re-creations of fossil animals, and their worlds; paleo-artists such as Doug Henderson, Jay Matternes, John Gurche
Literature -- David Quammen, Stephen J. Gould

Partners Bureau of Land Management
National Park Service
U of U Department of Anthropology

U of U Department of Geology and Geophysics
 Utah Rock Art Research Association
 Utah Professional Archeological Council
 Utah Statewide Archeological Society
 Utah Geological Survey

Site Connections

Anasazi State Park
 Edge of the Cedars State Park
 Fremont Indian State Park
 Buckhorn Wash, San Rafael Swell
 Hovenweep National Monument
 Utah Field House of Natural History
 Dinosaur National Monument
 Cleveland-Lloyd Dinosaur Quarry
 Dinosaurah!torium (St. George dinosaur footprints)
 Trilobite Fossil Beds
 Prehistoric Museum, College of Eastern Utah
 North American Museum of Ancient Life
 Eccles Dinosaur Park
 BYU Earth Sciences Museum
 BYU Museum of Peoples and Cultures
 Fossil Beds National Monument, Wyoming

6.7.3.2 Past Worlds: Program Components

Relative Size

Large

Viewshield

Out to shorelines, down into Bonneville Beach back to the past

Size

exhibits 14,750 sf
 education 1,200 sf
 outdoor 1,200 sf

Classroom

fossilab, peoplelab

Collections demonstration

fossil prep lab, anthropology conservation lab

Collections viewing

new arrivals area

Other artifacts/objects

living relatives of Utah's Pleistocene fauna
 Barrier Canyon mural
 quarry maps

Outdoors

demonstration dig site; garden of extinct plants;
garden of plants from Utah's past

Adjacent Observatories

Dynamic Landscape, Living World

6.7.4 Living World Observatory

— unravels the web of life so visitors can appreciate its intricacies

This observatory allows visitors to appreciate the intricacies of life on many scales, from microscopic to macroscopic. Through media, dioramas, models, and immersive recreations, visitors will take a fantastic “powers of ten” voyage from the nucleus of a cell to the world’s biomes. Beautiful images of the natural world will fill visitors with wonder, and naturalist guides will show them how to see the flora and fauna on the site. Visitors will be able to participate in biological surveys and animal behavior studies on the site. This observatory feels rich and alive, and visitors leave with a new sense of their relationship to the living world.



6.7.4.1 Living World: Interpretive Scope



Theme Life on Earth is interconnected and interdependent; life operates on many scales, from the DNA in your cells to the ecosystem you live in. Intact habitats (ecosystems) are essential for the survival of all species.

Lens The primary lens in this observatory is a sliding “powers of ten” scale that moves from micro to macro -- from DNA to ecosystems -- revealing the intricate connections and interdependencies that bind the living world together.

Topics ecology
evolution

genetics
health sciences
human evolutionary ecology
Utah focus: Utah biomes
Broader impacts/issues: biodiversity crisis and what we can do
UMNH and University research: island habitats and evolution/extinction -- Mike Windham, Eric Rickart, Bill Newmark; recent human evolutionary history and mtDNA -- Henry Harpending, Lynn Jorde, Alan Rogers; hunting in human evolution -- Kristen Hawks, James O'Connell

Collections Usage

20% vertebrates
20% botany
20% entomology
20% malacology
20% anthropology

Media Virtual herbarium
Live biome cameras

Timeframe

Recent to future

Art/Literature/Music

Art -- Andy Goldsworthy; natural history illustration
Literature -- Wallace Stegner, Katharine Coles, Barry Lopez, Terry Tempest Williams

Partners National Park Service
U of U Environmental Studies Program
U of U Department of Biology
Bureau of Land Management
Great Salt Lake Audubon Society
Utah Wetlands and Riparian Center
USDA-ARS Bee Biology and Systematics Laboratory
Hogle Zoo
Red Butte Garden and Arboretum
Red Rock Institute
Genetic Science Learning Center
Eccles Institute of Human Genetics

Site Connections

Hardware Ranch (elk watching in the winter)
Bear River Migratory Bird Refuge

Antelope Island State Park
 Ouray National Wildlife Refuge
 Flaming Gorge Dam (giant trout watching)
 Sheep Creek Canyon Geological Area, Ashley
 National Forest, Uinta Mountains
 Great Salt Lake Shorelands Reserve (TNC)
 Farmington Bay Waterfowl Management Area
 Matheson Wetlands Preserve (Colorado River)
 Lytle Ranch
 Red Cliffs Desert Reserve
 Fish Springs National Wildlife Refuge
 Utah's Hogle Zoo
 Red Butte Garden and Arboretum

6.7.4.2 Living World: Program Components

Relative Size

Large

Viewshed

Landscape Restoration

Size

Exhibits 8,000 sf

Education 1,200 sf

Outdoor 3,000 sf

Classroom

Genelab, ecolab

Collections Demonstration

Herbarium sheet preparation; entomology
preparation

Collections Viewing

Visible storage of vertebrates, entomology,
malacology, botany

Outdoors

Vivarium and bee garden; native plant garden;
ecology lab

Adjacent Observatories

Past World, Utah Futures

6.7.5 Native Voices Observatory

— where living tribes tell the stories of their past, present, and future

The living tribes are the center of the Native Voices Observatory -- they become the exhibit and the interpreters. A central performance stage features dancers, storytellers, and crafts and games demonstrations. Members of Utah's tribes staff the space, and their crafts are sold in the adjacent gift shop. This observatory is alive with the vibrancy of indigenous cultures, and celebrates their ability to adapt while conserving key aspects of their cultures.



6.7.5.1 Native Voices: Interpretive Scope

Theme Many indigenous peoples have inhabited North America for hundreds of years; their accounts of their past and their present can instruct and enlighten us.

Lens This lens is a “people lens” through which visitors meet people and hear their stories. It looks backward into tribal history and cultural heritage, and forward to their futures.

Topics Ethnography
Living Tribes
American Indian Experience in Utah
Creation stories and legends
Tribes and the larger community
Utah Focus: Utah's five tribes
Broader Impacts/Issues: endangered sites;
disappearing languages and cultures
UMNH Connection: the Museum's work with the
Indian Advisory Committee



Collections Usage

- 60% anthropology
- 10% botany
- 10% vertebrates
- 10% entomology
- 10% mineralogy

Timeframe

- 500 years ago to future

Media oral history and videography of Utah's tribes

Art/Literature/Music

- Literature -- N. Scott Momaday, Sherman Alexie
- Art -- tribal artists in residence; Steve Trimble and Linda Hogan photographs

Partners Utah tribes

- U of U Ethnic Studies Program
- Utah State Division of Indian Affairs
- American West Center
- Indian Walk-In Center
- UMNH Indian Advisory Committee

Site Connections

- American West Heritage Center
- American West Center
- Doris Duke Indian Oral History Collection at J. Willard Marriott Library
- Local Pow-Wows

6.7.5.2 Native Voices: Program Components

Relative Size

- Medium

Viewshed

- Orient east, use cardinal directions; paths

Size

- exhibits 4,000 sf
- outdoor 2,000 sf

Classroom

- N/A

Other Components

- Performance area, demo area

Collections Viewing

- Ethnography visible storage

Outdoors

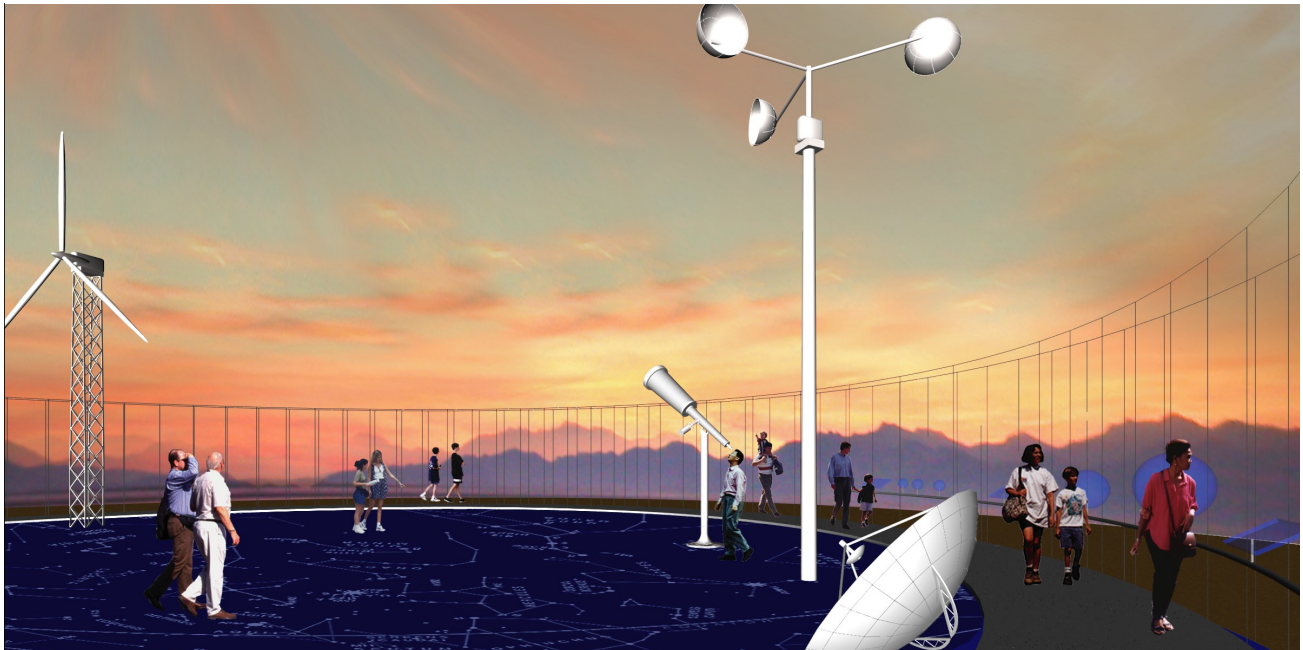
- Storytelling pavilion, garden of native plants used by tribes

Adjacent Observatories

- Utah Sky, Utah Futures

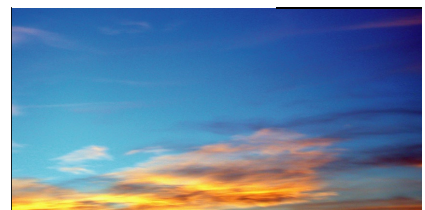
6.7.6 Utah Sky — celebrates the wonders of the sky and the Universe

Gazing up into the sky evokes awe and wonder, and makes us feel part of a larger, unexplored universe. This observatory focuses on the sky and the forces at work in our atmosphere. The new will be onto the everchanging sky -- a perfect vantage point for introducing visitors to the concept of change over time through paleoclimatology and global climate change.



6.7.6.1 Utah Sky: Interpretive Scope

- Theme** Our planet is just a small part of a vast universe; the heavens affect us in many ways -- through energy sources and weather patterns -- and they inspire us with awe and wonder.
- Lens** This observatory uses satellite images and a variety of lenses to allow visitors to observe weather, see the night sky, and look back in time at paleoclimates.
- Topics** weather, weather forecasting
astronomy
archaeoastronomy
paleoclimatology
climate
global climate change
alternative energies (solar and wind power)
mapping and satellite technology
Utah focus: Wasatch front and weather, snow



Broader impacts/issues: global climate change
University research: Katrina Moser; John Horel;
Andria Brunelle
Conservation connection: air pollution, light pollution

Timeframe

formation of universe to future

Collections Usage

80% mineralogy
20% anthropology

Media N/A

Art/Literature/Music

art — Nancy Holt
literature — Alan Lightman

Partners NOAA

NASA
U of U Department of Meteorology
Salt Lake City Astronomical Society
Salt Lake City Master Plan for Public Lighting
U of U Department of Physics

Site Connections

Salt Lake Observatory (in Tooele)
Clark Planetarium
Ott Planetarium
Campsites away from city lights

6.7.6.2 Utah Sky: Programming Components

Relative Size

Small

Viewshed

Horizon, sky; views west

Size

Exhibits 1,500 sf
Education 600 sf (shared with Great Salt Lake)
Outdoor 2,000 sf

Classroom

Waterlab

Collections Viewing

N/A

Other Artifacts/Objects

Star maps, sundials, celestial architecture

Outdoors

Roof terrace
Observatory and weather lab

Adjacent Observatories

Great Salt lake, Native Voices

6.7.7 Great Salt Lake Observatory — explores issues of water and conservation

This observatory has an amazing window wall that captures a wide view from the site to the lake. The observatory applies camera lenses, satellite views, and distance periscopes to bring visitors into the lake and the city's watershed. It gives visitors the opportunity to observe change on a human scale, and see the impact of changes to the watershed on their lives.



6.7.7.1 Great Salt Lake, Interpretive Scope

Theme Water is an essential resource for all life on the planet; we need to understand the critical importance of our watersheds.

Lens The lenses in this observatory look at cycles of change -- in the Great Salt Lake, we can see change at human scale in our lifetimes.

Topics Great Salt Lake watershed
ecology
water cycle
history of Great Salt Lake
weather patterns
geology
extractive industries
Broader impacts/issues: migratory birds and preservation of flight corridors, nesting sites; drought and water conservation

Collections Usage



- 30% vertebrates
- 20% anthropology
- 20% entomology
- 10% mineralogy
- 10% botany
- 10% malacology

Media live cameras
 animated model of region shows changes from Ice Age to present

Timeframe
 Ice Ages to future

Art/Literature/Music
 literature -- Ann Zwinger, Mark Reisner, Ellen Meloy
 art -- Robert Smithson

Partners Nature Conservancy
 U of U Department of Meteorology
 U of U Department of Geography
 Friends of Great Salt Lake
 NOAA Cooperative Institute for Regional Prediction
 Great Salt Lake Audubon Society
 U.S. Fish and Wildlife Service

Site Connections
 Antelope Island State Park
 Spiral Jetty
 Bear River Migratory Bird Refuge
 Great Salt Lake Shorelands Reserve
 Farmington Bay Waterfowl Management Area
 IUCN and RAMSAR (wetlands around the world)

6.7.7.2 Great Salt Lake: Program Components

Relative Size
 Small-medium

Viewshed
 Out to Great Salt Lake

Size exhibits 2,400 sf
 education 600 sf (shared with Utah Sky)
 outdoor 1,20 sf

Classroom
 Waterlab

Collections Viewing

Assembled selection of items collected at GSL

Other Artifacts/Objects

Living brine shrimp, watershed water table

Outdoors

Shared terrace and outdoor facilities with Utah Sky

Adjacent Observatories

Utah Sky, Dynamic Landscape

6.7.8 Utah Futures

— envisions scenarios for the state’s future, and invites visitors to explore its natural beauties

The Utah Futures Observatory, with its large interactive topo map, anchors a regional visitor center with a set of triptik stations. Visitors can map out a visit to destinations around the state, connecting to partner institutions, national parks, and trails based on themes in the Museum and their own interests. Tools of media and journalism reach out to rural communities throughout the state, and showcase the “Utah brand” for visitors. In the community gallery, Utah’s diverse communities create exhibits to represent themselves to visitors, and to explore issues they deem important. The Utah Futures Observatory offers visitors a glimpse of our future, and shows why our actions and understanding today make a difference.



6.7.8.1 Utah Futures: Interpretive Scope



- | | |
|--------|--|
| Theme | Utahns find common ground to discuss the future of their communities and their state; visitors find a guide and portal to the state’s wonders. |
| Lens | The lens here is a forum rather than a filter — a stage for a diversity of views. It is a reflexive lens, allowing Utahns to look at each other, and to see themselves as others see them. |
| Topics | diversity and connections
community
sustainability
Utah focus: Utah looks at itself, how others see Utah |

Broader impacts/issues: issues facing the arid west (land management, water, extractive industry, recreation)

Collections Usage

N/A

Media online opinion polls
virtual forum
futures scenarios let visitors choose actions on issues like population and the environment and see the results
live cams from around the state
videography project collects residents' ideas for the future, and visitors' impressions of the state
ongoing virtual travelogue lets visitors meet residents and hear their tips for hiking and dining
distance learning facility for Research Park and the University

Timeframe

present to future

Art/Literature/Music

art -- contemporary Utah artists
literature -- Wallace Stegner, Edward Abbey

Partners

American West Center
Wallace Stegner Center for Land, Resources, and the Environment
Salt Lake City museums
U of U Outdoor Recreation Program
Salt Lake Convention and Visitors Bureau
Utah Travel Council
Governor's Office of Planning and Budget

Site Connections

Utah House Demonstration and Learning Center
Jordan Water Conservancy Demonstration Garden
Salt Lake City Library
Utah Cultural Celebration Center

6.7.8.2 Utah Futures: Program Components

Relative Size

Small-Medium

Viewshed

out to city, Wasatch Front, and rest of state

Size

exhibits 1,500 sf

education 600 sf

Classroom

flex room

Other

Regional Visitor Center

Community gallery

Collections Viewing

Changing thematic assemblages

Adjacent Observatories

Living World, Native Voices

APPENDIX A

Existing Facilities Area and Plans

Inventory of Existing Areas

Summary of Areas in George Thomas Building		Existing Net SF
1.	Visitor Service Facilities	3,993
2.	Exhibition Areas	23,936
3.	Education Facilities	3,717
4.	Exhibit Support	4,558
5.	Collections / Curatorial	22,012
6.	Administrative	4,558
7.	Building Services	6,207
Total Net Area		68,981
Net to Gross Factor		1.29
Gross Area		88,941

Summary of Net Areas in William Stewart Building

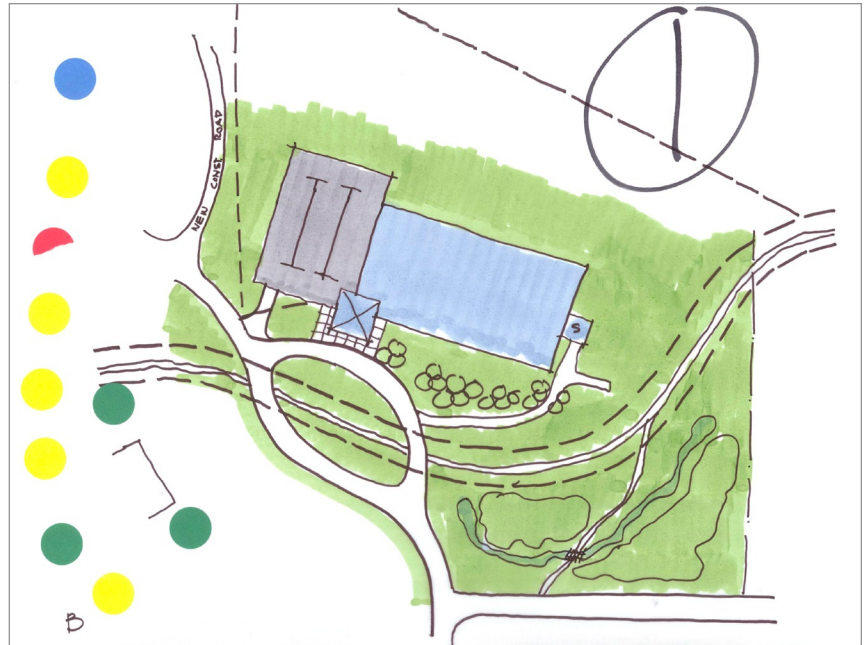
A.	First Floor - Collections	4,060
	100B - Field Equipment Storage	265
	104D - Paleontology Equipment Storage	453
	112 - Anthropology Collection Storage	957
	113 - Arch. Center (Collection Lab)	1,333
	114 - Zoo.-Arch. Lab	709
	114A - Collections (Dermestid Colony)	136
	114B - Photo Storage	207
B.	Second Floor - Collections	114
	216B - Collection Storage (Anthropology)	114
Total Net Area		4,174

Summary of Net Areas in Off-Campus Warehouse

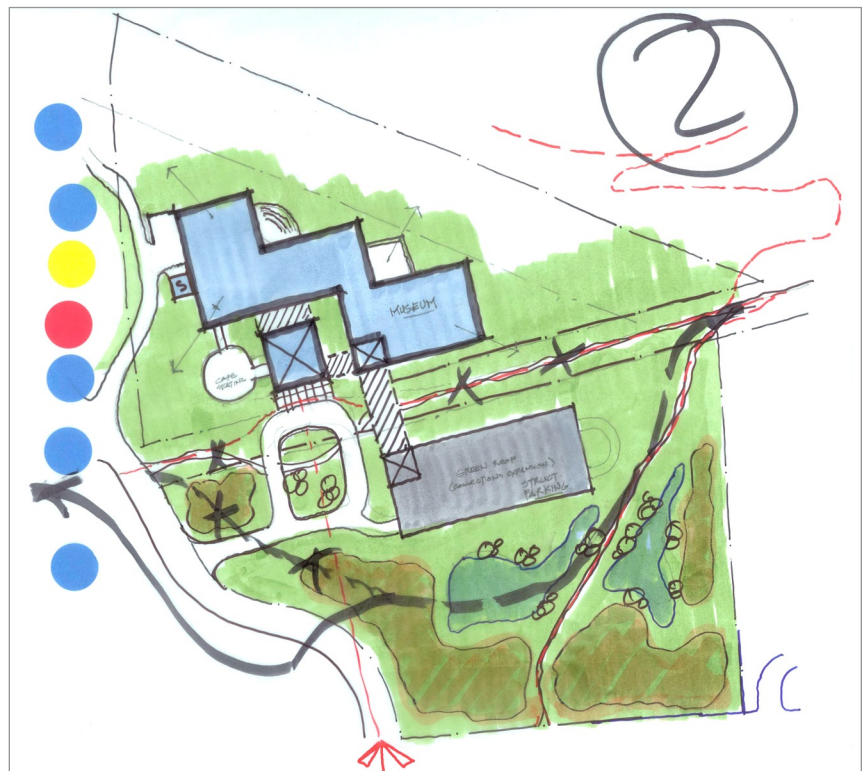
A.	Storage	4,241
	Exhibit Support / Store Storage	649
	Exhibit Support / Store Storage	3,201
	Anthropology Collections	391
B.	Collections	696
	Paleo Collections	696
C.	Restrooms	98
Total Net Area		5,035

APPENDIX B “Spacesaver” Analysis

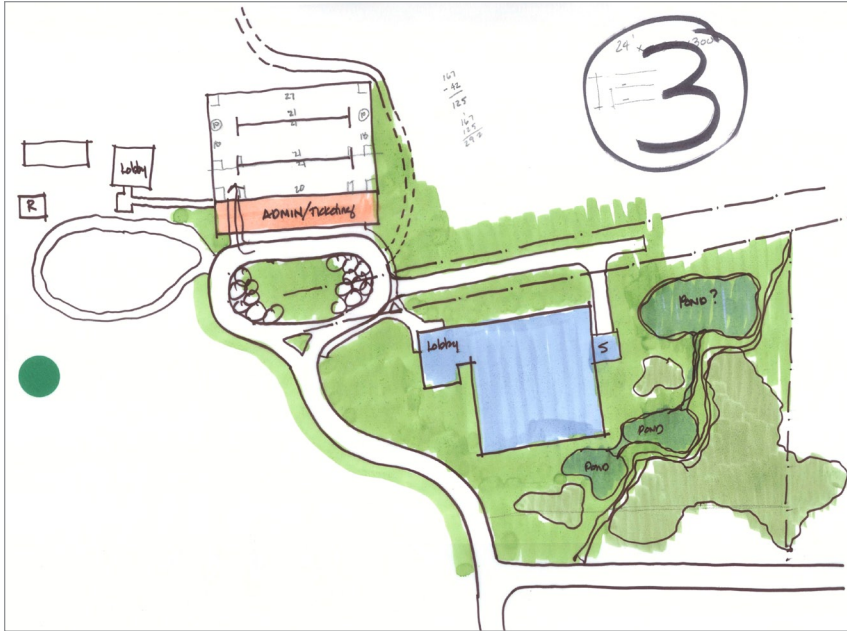
APPENDIX C
Site Development Studies



Option 1



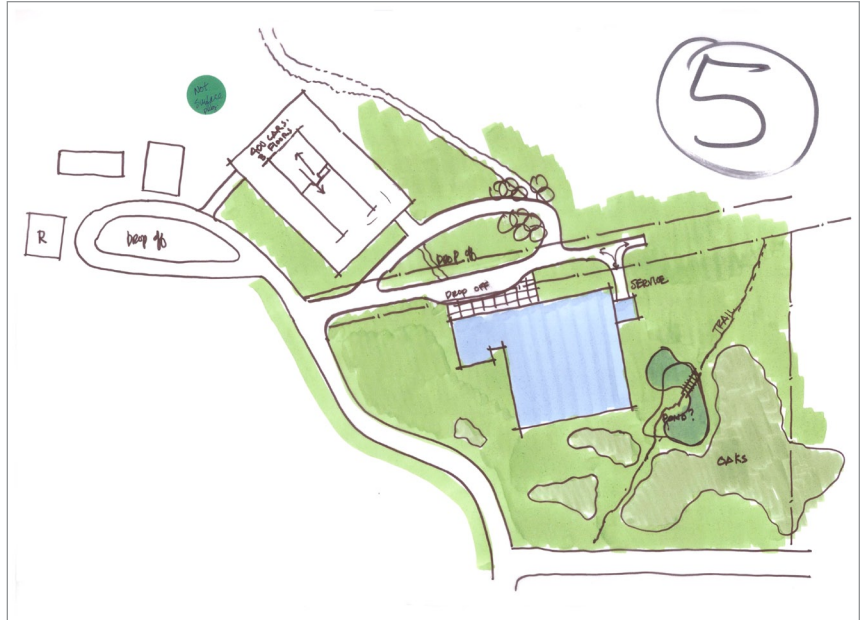
Option 2



Option 3



Option 4



Option 5



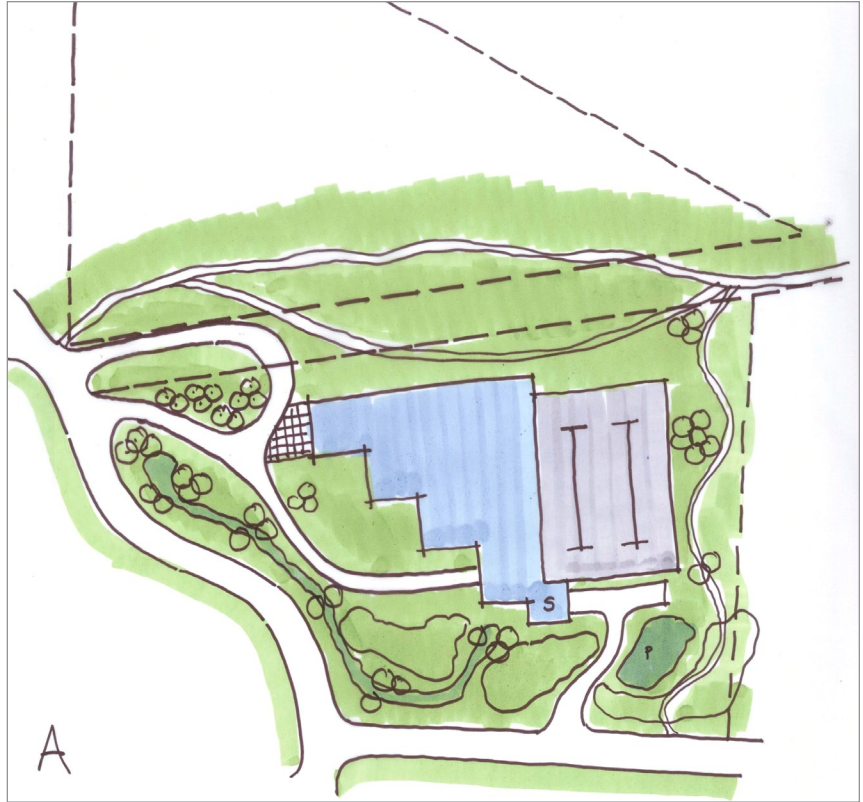
Option 6



Option 7



Option 8



Option 9



Option 10

ELECTRIC SERVICE AT RESEARCH PARK

In 2003, as programming proceeded for the new home for the Utah Museum of Natural History kicked off, the question of electrical service was raised. Would it be cost-effective to tie the new facility directly to the University's substation, instead of tying into UP&L's grid already present close to the site?

Currently, all facilities and programs located in the area recognized as Research Park purchase their electrical power directly from Utah Power and Light. Their invoices are based on Schedule 6. In contrast, university owned/leased substations, through our own distribution system, serve all facilities located on the campus proper. The rate for that consumption is based on a Schedule 9.

Schedule 6 is approximately 27% more costly than is Schedule 9. On the surface, it appeared that there would be a tempting cost avoidance realized by connecting this new load directly to our side of the substation. After careful evaluation, we (Mike Perez and Pete van der Have) agreed that it did **not** make economic sense to have UMNH to hook up to the U's grid.

The primary reasons are:

- First time cost for the project would be as much as \$2 million.
- The cost avoidance for the U would be approximately \$50,000/yr., generated by this project only, generating a payback period of **40 yrs.**
- Most of the facilities at the Park only start to revert to the U until after the 2030's, with many of them converting well into the 50's. If they all reverted today, conversion might make more sense, since it would generate a payback of approx. 4 years, considering any additional increase in first time cost.
- Selling "our" power to non-University facilities is not an option, thus we don't even need to consider requiring private entities to connect to our system.
- Currently there are only a handful of buildings in Research Park that "belong" to the U. Those that do, even if we could connect them to our grid, would save us another \$90,000. Without considering additional first time costs for those conversions (which there would be), the payback would still be at 14 years—hardly titillating.

The University may want to re-examine its options regarding power distribution at Research Park as the expiration date (2026) for the current Red Butte substation lease approaches. By that time, our relationship with UP&L may have changed, laws governing the purchase and sale of power definitely will have changed, etc. At that time, one option that may be worthy of further investigation is that the U purchase from UP&L this particular substation **and** the distribution system within the Park.

REVIEW SIGNATURES

University of Utah
Salt Lake City, Utah
DFCM Project No. 02243750
University of Utah Project No. 0872-9630
HEWV No. 03019.00

September 15, 2004
(Final Draft)

University of Utah
Review Signatures

We have reviewed all portions of the Project Description and warrant that it adequately represents our request for a facility to fulfill our mission and programming needs. All appropriate parties in the Agency have reviewed the document for completeness and accuracy.

David W. Pershing Senior Vice President, Academic Affairs	Date
Arnold B. Combe Vice President, Administrative Services	Date
Sarah B. George Executive Director, Utah Museum of Natural History	Date
Kari Astle Project Manager, Facilities Planning	Date
John Huish Director, Campus Design and Construction	Date

Division of Facilities Construction and Management
State of Utah
Review Signatures

We have reviewed the program jointly prepared with agency, for completeness and accuracy. These signatures do not necessarily represent an endorsement or the need of this requested space at this time.

_____ Lyle R. Knudsen Program Director, DFCM	_____ Date
--	---------------

PROJECT PARTICIPANTS

This Project Description is the result of the dedicated participation of many groups and individuals. The primary groups and their representatives are listed below. Acknowledgement and listing of additional project participants is recorded in the Appendix section of this document.

OWNER / USER

Utah Museum of Natural History

Sarah George, Director

University of Utah Facilities Planning

Kari Astle, Project Manager, Facilities Planning

Rick Johansen, Project Manager, Campus Design and Construction

State of Utah, Division of Facilities and Construction Management

Lyle R. Knudsen, Program Director

Steering Committee

Dr. David Pershing, Co-Chair

Sarah George, Co-Chair

Frank Brown, Dean, College of Mines and Earth Sciences

David Dee, Director, Utah Museum of Fine Arts

Ann Hanniball, Associate Director, Utah Museum of Natural History

Steven Ott, Dean, College of Social and Behavioral Sciences

Building Committee

Ann Hanniball, Associate Director, Utah Museum of Natural History

Patti Carpenter, Public Relations Manager, Utah Museum of Natural History

Jamie Creola, Education Manager, Utah Museum of Natural History

Janet Frasier, Development Director, Utah Museum of Natural History

Becky Menlove, Exhibits Manager, Utah Museum of Natural History

Duncan Metcalfe, Curator of Archaeology, Utah Museum of Natural History

Scott Sampson, Chief Curator and Curator of Vertebrate Paleontology, Utah Museum of Natural History

PLANNING TEAM

Project Facilitator and Site Planner

Hanbury Evans Wright Vlattas + Company

Architecture/Preservation/Planning/Interiors/Landscape

Jane Wright, AIA

Gil Carpenter, AIA

Buddy Hall, LAIA

Jimmy Stevens

Architectural Programmers

E. Verner Johnson and Associates

Museum Architects and Planners

E. Verner Johnson, AIA

Thomas A. Troller, AIA

Mechanical, Electrical, Plumbing Engineers

R.G. Vanderweil Engineers

Joseph Manfredi

Structural Engineers

Souza, True, and Partners, Engineers

Terry Louderback

Local Architectural Liaison

Architectural Nexus, Architects

David Cassil, AIA

Interpretive Program Planner

Ralph Appelbaum and Associates

Planning and Design

Ralph Appelbaum

Tim Ventimiglia

Miranda Smith

Anne Bernard